A study on the prevalence of depression and its risk factors among adult population of Siliguri subdivision of Darjeeling district, West Bengal

Sudip Banik Chaudhuri¹, Pankaj Kumar Mandal², Manasi Chakrabartty³, Gautam Bandyopadhyay⁴, Sharmistha Bhattacherjee⁵

¹Department of Community Medicine, IQ City Medical College and Hospital, Durgapur, ²Department of Community Medicine, ID and BG Hospital, ³Department of Psychiatry, Sagar Dutta Medical College, Kolkata, ⁴Department of Community Medicine, North Bengal Medical College, Siliguri, West Bengal, ⁵Department of Community Medicine, MGM Medical College, Kishanganj, Bihar, India

Abstract

Introduction: Considering morbidity and mortality, depression is a burning issue in the modern civilization. Early diagnosis and treatment significantly reduces the incidence of morbidity and mortality. In this context, the present study was conducted to find the prevalence and associated factors of depression among adult population of Siliguri subdivision, Darjeeling district, West Bengal. Materials and Methods: A community-based cross-sectional study was conducted among adult population (≥18 years) of Siliguri subdivision of Darjeeling district, West Bengal. Thirty-cluster sampling method was used to identify the study participants. Beck’s depression inventory-II was used as the screening tool. Binary logistic regression was done to find the associated factors of depression using IBM SPSS software Version 20.0 (Armonk, New York). Results: Overall, 36% of the study participants were depressed and 11% were significantly depressed. In binary logistic regression, female gender, rural resident, and lower educational status were found to be significantly associated with depression. Conclusion: Screening of depression and early identification of associated factors helps in reducing the adverse outcome of depression. More than one-third of the population depressed and there were some modifiable associated factors such as educational status and rural residence.

Keywords: Adults, depression, prevalence, risk factors, Siliguri

Introduction:

Everyone occasionally feels blue or sad but these feelings are usually short-lived and pass within a couple of days.[1] However, sadness becomes problematic when duration increases. There is a critical level above which it is marked as depression. Depression is one of the most prevalent and treatable mental disorders presenting, in general, medical as well as specialty settings.[2]

Depression is a disorder of major public health importance.[3] In 2012, depression is estimated to affect 350 million people worldwide.[4] In different countries, the prevalence of depression was different. Lifetime prevalence rates range from approximately 3% in Japan to 16.9% in the United States, with most countries falling somewhere between 8% and 12%.[5]

In India also, the prevalence of depression varies from place to place. In a study conducted in Chennai among urban adult population, the age-standardized prevalence of depression was found to be 15.9%.[6] A meta-analysis conducted by Reddy and Chandrasekhar showed that the prevalence of depression was 7.9–8.9 per thousand population, and the prevalence rates were nearly twice in the urban areas.[7] A study done by Nandi et al.

Address for correspondence: Dr. Sudip Banik Chaudhuri, Shimulpur, Thakurnagar, North 24 Parganas, West Bengal, India.
E-mail: baniksudip84@gmail.com

Access this article online
Quick Response Code: Website: www.jfmpc.com
DOI: 10.4103/jfmpc.jfmpc_326_16

How to cite this article: Chaudhuri SB, Mandal PK, Chakrabartty M, Bandyopadhyay G, Bhattacherjee S. A study on the prevalence of depression and its risk factors among adult population of Siliguri subdivision of Darjeeling district, West Bengal. J Family Med Prim Care 2017;6:351-5.
in a rural area of West Bengal, revealed that though overall psychiatric morbidity did not show a statistical significant change over a period of 20 years, prevalence of depression increased from 4.99% in 1972 to 7.39% in 1992. The prevalence of depression increased from 4.99% in 1972 to 7.39% in 1992.

Some risk factors such as age, female gender, illiteracy, below poverty line, living alone, economical dependency, staying without spouse, not being consulted for decisions, and feeling of ill have been identified in different studies.

Timely identification and adequate treatment saves valuable lives as well as decrease the suffering. In this context of paucity of relevant community-based studies in West Bengal, especially in Darjeeling district, the study was conducted to find the prevalence and different associated factors of depression among adult population in Darjeeling district.

**Materials and Methods**

The community-based cross-sectional study was conducted among adult population (≥18 years) of Siliguri subdivision of Darjeeling district, West Bengal. Siliguri subdivision has four blocks (Matigara, Naxalbari, Phansidewa, and Khoribari) and one municipal corporation (Siliguri municipal corporation). The study was conducted between May 2013 and April 2015. Participants who could read and understand Bengali and English were included in the study and seriously physical and mental ill patients were excluded from the study.

Assuming the anticipated population proportion of 15.9%, confidence interval (CI) 95%, absolute precision 5% and using the formula \( N = \frac{Z^2}{1-a^2} \times (1 - P) / d^2 \), sample size summed up to 206. Here, \( N = \) sample size, \( Z = \) Standard normal deviate at 95% CI = 1.96, \( d = \) Absolute precision, \( P = \) Prevalence of disease.

Considering the design effect 2, sample size was taken as 412 as cluster sampling was used. Taking partial response as 15%, the sample size reached 474 and finally it has been rounded off to 480. After data collection, excluding incomplete data, ultimately 469 data were analyzed.

Wards in urban area and village in rural area were considered as cluster. Thirty-cluster sampling method was used. Using the population proportion to size 16, people from each cluster and maximum one eligible person from the selected household were randomly chosen.

Beck’s depression inventory (BDI) was used and translated and validated into local Bengali language. The questionnaire comprised two parts: the first part included general sociodemographic characteristics which were filled by the researcher and the second part included BDI questionnaire which was filled by the participants themselves. The BDI has 21 multiple-choice questionnaire and answers of each questionnaire have values from 0 to 3. According to BDI scoring, depression had been classified into low (0–16), moderate (17–30), and significant (>31).

**Results**

Of the 469 study participants, 50.7% belonged to 18–29 years’ age group. The mean age of the study population was 33.17 years (±13.5 standard deviation). Nearly 56.7% of the study participants were female. Almost 64.6% of the study population were from rural area and rest were from urban area. About 28.7% of participants completed high school and 15.4% graduation.

Among the 469 study participants, 22 were either widowed or divorced whereas 292 were currently married. A major proportion of the study participants were homemakers (31.8%) and students (18.7%).

| Table 1: Distribution of the study participants according to different sociodemographic characteristics (n=469) |
|-------------------------------------------------|-------------------------------------------------|-------------------|
| General characteristics | n (%) | Age (years) |
|-------------------------|-------|-------------|
|                         |       | 18-29       | 238 (50.7) |
|                         |       | 30-39       | 88 (18.8) |
|                         |       | 40-49       | 75 (16.0) |
|                         |       | 50-59       | 31 (6.6) |
|                         |       | ≥60         | 37 (7.9) |
| Gender                  |       | Female      | 266 (56.7) |
|                         |       | Male        | 203 (43.3) |
| Residence               |       | Rural       | 303 (64.6) |
|                         |       | Urban       | 166 (35.4) |
| Religion                |       | Hindu       | 422 (90.0) |
|                         |       | Muslim      | 22 (4.7) |
|                         |       | Christian   | 21 (4.5) |
|                         |       | Buddhist    | 4 (0.8) |
| Caste                   |       | General     | 247 (52.7) |
|                         |       | Scheduled caste | 141 (30.1) |
|                         |       | Scheduled tribe | 44 (9.3) |
|                         |       | Other backward classes | 37 (7.9) |
| Education               |       | Primary     | 22 (4.7) |
|                         |       | Middle school | 118 (25.2) |
|                         |       | High school  | 135 (28.7) |
|                         |       | Higher secondary | 122 (26.0) |
|                         |       | Graduate and above | 72 (15.4) |
| Marital status          |       | Currently married | 292 (62.3) |
|                         |       | Never married | 155 (33.0) |
|                         |       | Widowed and divorced | 22 (4.7) |
| Occupation              |       | Skilled worker | 30 (6.4) |
|                         |       | Unskilled worker | 80 (17.1) |
|                         |       | Semi-professional and professional | 31 (6.6) |
|                         |       | Student      | 88 (18.7) |
|                         |       | Homemaker    | 149 (31.8) |
|                         |       | Businessperson | 46 (9.8) |
|                         |       | Retired      | 16 (3.4) |
|                         |       | Unemployed   | 29 (6.2) |
It was found that overall 36% of the study participants were depressed and 11% were significantly depressed [Table 2].

In univariate analysis, among the participants, the proportion of depression was highest in 30–39 years' age group (43.2%). It was found that females (39.8%) and rural population (41.6%) were significantly depressed. It was found that though proportion of depression was more among those who had any type of substance dependence (40.3%) compared to those who did not (32.8%), it was not statistically significant [Table 3].

Another important observation, proportion of depression, was less (25.5%) among those whose educational qualification was higher secondary and above.

Among the different associated factors, binary logistic regression was done and it was found that female gender, rural habitant, and lower educated are the risk factors associated with developing depression.

**Discussion**

With the advent of modern civilization along with other noncommunicable diseases, mental diseases are increasing.

The findings of this analysis illustrate that the prevalence of depression was 36% among adult population which was relatively higher compared to the findings of most of the previous researchers.[6,12] Reddy and Chandrasekhar conducted a meta-analysis which included 13 different community-based studies reported that the prevalence of depression was between 7.9 and 8.9 per thousand population, and the prevalence rates were nearly twice in the urban areas.[7] The prevalence of depression was found to be 39.1% by Nakulan et al. in Kerala, which may be due to the fact that older age group was their study participants.[16] Nautiyal et al., in Dehradun city, found that 29.1% of their study participants were depressed which was lower than that of our finding. This difference is attributed to different age group, area, and different scale used in that study.[17]

Similar to other health issues, prevalence of depression is also a dynamic entity. Day by day, stresses and other risk factors of depression are increasing, so the chance of increase in prevalence of depression is also increasing in recent studies.

**Table 2: Distribution of the study participants according to severity of depression (n=469)**

| Severity of depression (Beck's score) | Frequency (%) | Total (%) |
|--------------------------------------|--------------|-----------|
| Low* (0-16)                          | 300 (64.0)   | 326 (100.0) |
| Moderate (17-30)                     | 118 (25.0)   | 169 (36.0) |
| Significant (≥31)                    | 51 (11.0)    | 51 (11.0)  |
| Total                                | 469 (100.0)  |           |

*According to Beck's depression inventory, low score (0-16) clinically not considered as depression

**Table 3: Sociodemographic and other correlates of depression (n=469)**

| Variables                          | Absent (%) | Present (%) | Total (%) | Statistical test OR (95% CI) |
|------------------------------------|------------|-------------|-----------|-------------------------------|
| Age (years)                        |            |             |           |                               |
| 18-39                              | 216 (66.3) | 110 (33.7)  | 326 (100.0) | 0.830 (0.388-1.774)           |
| 40-59                              | 62 (58.5)  | 44 (41.5)   | 106 (100.0) | 1.046 (0.463-2.364)           |
| 60 and above                       | 24 (64.9)  | 13 (35.1)   | 37 (100.0)  | 1 (referent)                  |
| Gender                             |            |             |           |                               |
| Female                             | 160 (60.2) | 106 (39.8)  | 266 (100.0) | 1.871 (1.196-2.925)*          |
| Male                               | 142 (70.0) | 61 (30.0)   | 203 (100.0) | 1 (referent)                  |
| Address                            |            |             |           |                               |
| Rural                              | 177 (58.4) | 126 (41.6)  | 303 (100.0) | 1.972 (1.248-3.117)*          |
| Urban                              | 125 (75.3) | 41 (24.7)   | 166 (100.0) | 1 (referent)                  |
| Education                          |            |             |           |                               |
| Primary-high school                | 159 (57.4) | 118 (42.6)  | 277 (100.0) | 1.955 (1.250-3.057)*          |
| Higher secondary and above         | 143 (74.5) | 49 (25.5)   | 192 (100.0) | 1 (referent)                  |
| Socioeconomic status               |            |             |           |                               |
| Class I and II                     | 155 (68.3) | 72 (31.7)   | 227 (100.0) | 1.065 (0.680-1.668)           |
| Class III and IV                   | 147 (60.7) | 95 (39.3)   | 242 (100.0) | 1 (referent)                  |
| Substance abuse                    |            |             |           |                               |
| Yes                                | 105 (59.7) | 71 (40.3)   | 176 (100.0) | 1.412 (0.891-2.239)           |
| No                                 | 197 (67.2) | 96 (32.8)   | 293 (100.0) | 1 (referent)                  |

*P ≤0.05. OR: Odds ratio; CI: Confidence interval
It was observed that the prevalence of depression in nearby country like Bangladesh among the adults was 4.6% in a study in 2007.\cite{14} Reason of international variation may depend on the level of sociocultural deference.

Hence, in short, deference in the prevalence of depression could be attributed to different ethnicity and demographic characteristics of the study populations, different diagnostic criteria, study instruments employed, and time frame.

The study also revealed that 11% of the study participants had a significant level of depression and 25% had moderate level of depression. Hence, among the depressed participants, more or less one-third required special care and psychiatric consultation in urgent basis.

In the current study, the proportion of depression was lowest (30.3%) among 18–29 years’ and highest (43.2%) among 30–39 years’ age group. Again, there was a gradual reduction in the proportion of depression after 39 years. This type of finding is due to the fact that 30–39 years’ age group carries major burden of the family and after that there was shifting of responsibilities to younger family members though some age-related physical and mental changes may affect 60 years and above age group. Similarly, increased trend of depression with age was reported in different studies\cite{14,19,21}. In another study, Danesh and Ladeen reported that the highest prevalence rate of lifetime depression (14.3%) was in the age group between 20 and 24 years.\cite{20}

The study revealed that the proportion of depression was more among female (39.8%) than among male (30%) and it was statistically significant. This finding is consistent with most of the studies conducted in different parts of the world.\cite{6,19-21}

In the present study, the proportion of depression was more among rural population (42.2%) than among urban population (24.6%), and the distribution was found to be statistically significant. Reddy and Chandrasekhar’s meta-analysis revealed that the prevalence rates were nearly twice in the urban areas.\cite{7} The area where the current study was conducted includes both urban and rural areas, but here urban area was not so much crowded like metros whereas rural areas were not very much in touch with urban area. However, there were other studies which found similar finding like the current study.\cite{22}

The present study revealed that the proportion of depression was less among the study participants who had higher secondary and above level of education (25.5%). It also revealed that the proportion of depression was decreasing with increase in the level of education. This distribution was found to be statistically significant. Similarly, Kennedy et al.\cite{23} and Penninx et al. reported a significantly higher prevalence of depression among individuals with lower level of education.\cite{24} Contrary to this, Danesh and Ladeen revealed that the proportion of depression was high among those who had higher education level.\cite{19}

The current study showed that depression was higher among those who belonged to socioeconomic Class III and IV (39.3%) and lowest among the study participants of socioeconomic Class I and II (31.7%) according to B. G. Prasad scale. Although this was not statistically significant, this was consistent with different studies conducted in India and in different parts of the world.\cite{20,13}

**Conclusion**

A considerable proportion of the population was found to be depressed which may serve as important baseline information for future research. A longitudinal study would help in better understanding of risk factors which can facilitate targeted preventive efforts to people exposed to risk, and would also help in increasing our knowledge on the etiology of depression and other comorbid disorders.

**Acknowledgment**

We would like to acknowledge the support of all teaching and nonteaching staff of the Department of Community Medicine and Psychiatry of North Bengal Medical College and Hospital (2012–2015).

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. National Institute of Mental Health. Depression. Boulevard: U.S. Department of Health & Human Services; 2011. p. 1-24.
2. World Health Organization. The Global Burden of Disease 2004 Updates. Geneva: World Health Organization; 2008.
3. World Health Organisation. Integrating Mental Health into Primary Care: A Global Perspective. Geneva: World Health Organisation; 2008. Available from: http://www.who.int/mental_health/policy//mentalhealthintoprimarycare/e. [Last accessed on 2013 Jul 18].
4. World Health Organisation. Depression. Fact Sheet. April, 2016. Available from: http://www.who.int/mediacentre/factsheets/fs369/en/. [Last accessed on 2016 Dec 24].
5. Andrade L, Caraveo-Anduaga JJ, Berglund P, Bijl RV, De Graaf R, Vollebergh W, et al. The epidemiology of major depressive episodes: Results from the international consortium of psychiatric epidemiology (ICPE) surveys. Int J Methods Psychiatr Res 2003;12:3-21.
6. Poongothai S, Pradeepa R, Ganesan A, Mohan V. Prevalence of depression in a large urban South Indian population – The Chennai urban rural epidemiology study (CURES-70). PLoS One 2009;4:e7185.
7. Reddy VM, Chandrashekar CR. Prevalence of mental and behavioural disorders in India: A meta-analysis. Indian J Psychiatry 1998;40:149-57.
8. Nandi DN, Banerjee G, Mukherjee SP, Ghosh A, Nandi PS, Nandi S. Psychiatric morbidity of a rural Indian community. Changes over a 20-year interval. Br J Psychiatry 2000;176:351-6.

9. Swarnalatha N. The prevalence of depression among the rural elderly in Chittoor district, Andhra Pradesh. J Clin Diagn Res 2013;7:1356-60.

10. Maulik S, Dasgupta A. Depression and its determinants in the rural elderly of West Bengal – A cross sectional study. Int J Biol Med Res 2012;3:1299-302.

11. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561‑71.

12. Kader Maideen SF, Sidik SM, Rampal L, Mukhtar F. Prevalence, associated factors and predictors of depression among adults in the community of Selangor, Malaysia. PLoS One 2014;9:e95395.

13. Isometsä E, Aro S, Aro H. Depression in Finland: A computer assisted telephone interview study. Acta Psychiatr Scand 1997;96:122-8.

14. Grover S, Dutt A, Avasthi A. An overview of Indian research in depression. Indian J Psychiatry 2010;52 Suppl 1:S178‑88.

15. Ruiz P, editor. Ethnicity and Psychopharmacology. Washington, DC: American Psychiatric Press; 2001.

16. Nakulan A, Sumesh TP, Kumar S, Rejani PP, Shaji KS. Prevalence and risk factors for depression among community resident older people in Kerala. Indian J Psychiatry 2015;57:262-6.

17. Nautiyal A, Satheesh Madhav NV, Ojha A, Sharma RK, Bhargava S, Kothiyal P, et al. Prevalence of depression among geriatric people in Dehradun city of Uttarakhand, India. J Depress Anxiety 2015;4:208.

18. Ferrari AJ, Charlson FJ, Norman RE, Patten SB, Freedman G, Murray CJ, et al. Burden of depressive disorders by country, sex, age, and year: Findings from the global burden of disease study 2010. PLoS Med 2013;10:e1001547.

19. Danesh NA, Ladeen J. Relation between depression and socio demographic factors. Int J Ment Health Syst 2007;1:1-9.

20. World Health Organization. The Global Burden of Mental Disorders and the Need for a Comprehensive, Coordinated Response from Health and Social Sectors at the Country Level. Sixty-fifth World Health Assembly; 2012. Available from: http://www.apps.who.int/gb/ebwha/pdf_files/WHA65/A65_R4‑en.pdf?ua=1. [Last accessed on 2014 Aug 20].

21. Lawson E, Craig T, Bhugra D. Psychological symptoms in women in a primary care setting in Tamil Nadu. Indian J Psychiatry 2005;47:229‑32.

22. Probst JC, Laditka SB, Moore CG. Rural‑urban differences in depression prevalence: Implications for family medicine. Health Serv Res 2006;38:653‑60.

23. Kennedy GJ, Kelman HR, Thomas C, Wisniewski W, Metz H, Bijur PE. Hierarchy of characteristics associated with depressive symptoms in an urban elderly sample. Am J Psychiatry 1989;146:220‑5.

24. Penninx BW, Leveille S, Ferrucci L, van Eijk JT, Guralnik JM. Exploring the effect of depression on physical disability: Longitudinal evidence from the established populations for epidemiologic studies of the elderly. American J Public Health 1999;89:1346‑52.