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ORIGINAL ARTICLE

A Cross-Sectional Descriptive Population-Based Study To Estimate The Prevalence Of Depression In An Urban Slum In Chennai City And The Associated Risk Factors

MUTHUKUMAR K* AND BHARATWAJ R S**

ABSTRACT

Introduction

Depression has been under diagnosed and under reported in primary care settings. Various illnesses and biopsychosocial factors have been implicated as the contributing factors for depression. The overall rate of depression has increased in recent decades; depression is now being seen at younger ages and with greater frequency worldwide.

Very few studies have been done in the past to estimate the magnitude of the problem of depression in the community in India, particularly so in the urban slums.

Method

A cross sectional descriptive study was done. An urban slum in ward 131 of Chennai city was selected by using a simple random table, from among the 155 wards in the Chennai Corporation.

700 individuals who were aged between 15 and 65 years, from the urban slum of ward 131, were chosen by simple random sampling and were screened by a General Health Questionnaire (GHQ-12), followed by assessment by using Beck's Depression Inventory scale (BDI).

Statistical analysis was done by the authors by using the SPSS 12 Version.

Results

The prevalence of depression in the study population was 22.8%, which included mild depression (20.7%) and moderate depression (2.1%). Female gender, illiteracy, being single after marriage in the form of being separated or divorced, widow or widower and the loss of one or both the parents before attaining 16 years of age were found to be the factors which were significantly associated with depression.

Conclusion

A large proportion of people in the urban slum had depression and many psychosocial factors were found to be associated with it. Health care personnel must be trained to identify the vulnerable groups and appropriate treatment should be administered at the primary care setting itself. In India, due to the scarcity of mental health services and resources, the policy makers can consider encouraging community participation in the form of the creation of self help groups with the support of the grass root level health workers.

Key Words

Chennai, Depression, GHQ (General Health Questionnaire) and BDI (Beck's Depression inventory scale)

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Introduction

"Health is a state of complete physical, mental and social well being and not merely an absence of disease or infirmity"[1]

Mental, behavioural, and social health problems are an increasing part[2] of the health problems world over. Yet, these have received scant attention outside the wealthier, industrialized nations. The World Health Organization (WHO) declared Mental Health**: "STOP EXCLUSION: DARE TO CARE"** as the theme of the World Health Day, on 7th April 2001 in recognition of the burden that mental and brain disorders pose on people and the families which are affected by them.

At present [3], major and minor mental disorders are among the leading morbidity and mortality producing conditions in both the developing and the developed countries. The global burden of disease for neuropsychiatric disorders, as measured by the loss of DALY'S (Disability Adjusted Life Year), was estimated[4] to be 6.8% worldwide. The overall DALY'S for neuropsychiatric disorders is estimated[5] to increase to 15% by the year 2020 and this is proportionately larger than that of the CVS diseases.

Though the burden of illness resulting from psychiatric and behavioural disorders is enormous, it is grossly under-represented[6] by the conventional public health statistics, which tend to focus on mortality rather than morbidity and dysfunction. Deaths are traditionally ascribed to their proximate causes, rather than to the underlying disease states or behaviours that lead to the final crisis; thus, a death may be attributed to liver failure, when the underlying cause for the liver failure may be ***alcoholism due to depression*** and ***in depression, relapse is common*** and care over a long term is essential.

The number of persons with major and minor disorders is likely to increase[7] substantially in the decades to come, for two reasons:

(a) The number of people living in the age group which is at a risk for certain mental disorders is increasing due to the change in the demographics.

(b). The overall incidence in the rate of depression has increased in recent years. Depression is now being seen at younger ages and with greater frequency worldwide.

Depressed patients suffer as much disability and distress, if not more, as patients with chronic medical disorders such as systemic hypertension, diabetes mellitus, coronary artery disease and arthritis[8]. Though clear guidelines for the management of depression are available, which include antidepressants and psychological interventions like cognitive therapy and social support, the majority of people suffering from depression do not receive adequate treatment[8].

Depression is the principal or secondary reason for seeking care in as many as one-fifth to one-third of the patients who attend primary health care clinics in low income countries according to the findings that have been reported from research studies from North America and Europe[9].

In addition to this, primary care providers fail to diagnose and treat as many as 35% to 50% of the patients with depressive disorders.[10] Therefore, the depression produces far more morbidity in the community. Suicide is an important consequence of depression[11]. Every year, 10-20-million people attempt suicide and one million of them[12] – including many who are young – do kill themselves, thus increasing the premature mortality.

Though the National Mental Health Programme was launched by the Government of India in 1982, there are an estimated **70 million mentally ill people in India and 10% alone receive active psychiatric assistance or help, with only** 4000 qualified **Psychiatrists, 2000 Psychiatric Social Workers and 400 Psychiatric nurses** [13] attending to them. In a country which has crossed a population of one billion, only 121 districts in 30 states and union territories are covered under the District Mental Health Programme[14]

In view of the above scenario, the present study was conducted to estimate the prevalence of depression in an urban slum of Chennai city by using the time tested case finding instruments for depression in primary care settings[15], namely the General Health Questionnaire and Beck's Depression Inventory scale.

Method

The authors conducted the study after informing the purpose of the study to each of the study participants and after obtaining an informed written consent from the study participants. In the case of illiterates, the authors got their thumb impression, so as to ensure that they are willing to participate in the study, as the study was addressing some of the sensitive personal issues of the participants.

STUDY DESIGN: A cross sectional descriptive study was chosen, as it measures the proportion of people who have depression at a specified point or period. The results of this study will be valuable for administrative purposes, for example, for determining the workload of the personnel in a health programme and they will also be useful in 'Community diagnosis', i.e. to identify the communities that need special programmes or action to prevent the illness.

STUDY AREA: From among the 155 wards in Chennai Corporation, Ward 131 was selected by a simple random technique with the help of a random number table, and the urban slum in ward 131 was chosen as the study area. **Ward 131, Kodambakkam, which is in the Zone IX Saidapet of** Chennai Corporation**, is situated at 13.0481 N latitude and 80.2214 E longitude. It is one of the westerly located neighbourhoods of Chennai city.**

According to the Family register in ward 131, there were 7342 families in the ward 131 with the population of 45044. The total population in the urban slum in ward 131 was 13626, among which there were 7792 persons aged more than 15 years.

STUDY POPULATION:
INCLUSION CRITERIA

- All those aged[16] between 15 and 65 years in the urban slum of ward 131
- Those who were able to provide informed consent

EXCLUSION CRITERIA

- **Those who were not willing to participate in the study**
- **Those who were aged less than 15 years and more than 65 years.**

CALCULATION OF SAMPLE SIZE;

The following formula[17] was used for calculating the sample size for estimating the population proportion with specified relative precision,

$$\text{Sample size (n)} = (Z_{1-\alpha})^2 P(1-P)/\varepsilon^2,$$

Where $Z_{1-\alpha}$ is confidence level at 95% (standard value of 1.96), '*P*' is estimated prevalence of depressed in the previous study and 'ε' is the allowable error (Relative precision).

The sample size here, was calculated on the basis of 20% prevalence of depression[18] and a relative precision of 15%, with a 95% confidence interval.

$$N = 3.84(20 \times 80) / 3 \times 3$$

$$\mathbf{N} = 683$$

This sample size was rounded off to 700.

SAMPLING METHOD;

All the people between 15 - 65 years in ward 131 were enlisted in the sampling frame. Among them, 700 were selected by simple random sampling. The purpose of the study was explained to the study participants and a valid consent was obtained from everyone who participated in the study. Confidentiality and

empathy were suitably applied as and when sensitive and emotional issues were addressed. The Multi Purpose Health worker (MPHW), the grass root level health worker who is the first level contact between the individual in the community and the Health care delivery system, attached to the Health post, ward 131, informed the study participants that the researcher, a qualified medical Doctor was going to make it to their home for conducting the study

STUDY TOOLS;

1. Basic questionnaire.
2. General Health Questionnaire[19] (GHQ)
3. Beck's Depression Inventory scale[20] (BDI)

A semi-structured baseline questionnaire in Tamil, (the local language of the participants) comprising of questions on the age, sex, educational, occupational, income and marital status of the participants, whether their parents were alive or not, if not whether the death of the parent occurred before or after the study participant attained sixteen years, current medical illnesses and medications if any and questions related to personal habits such as smoking, alcohol and substance abuse, was constructed. The participants were asked to fill the baseline questionnaire and for the illiterates[21], the Author (1) read the contents and the obtained data were documented. The two psychological rating scales, the *12-item General Health Questionnaire (GHQ)* and the *13 item Beck Depression Inventory* (BDI) scale were used. The *12-item General Health Questionnaire was* given to the participants and the *13 item Beck Depression Inventory* (BDI) scale was given to those who had been found to have psychiatric morbidity, as screened by the *(GHQ)*. People who could read were given the Tamil version of the self-rating scales and were asked to encircle the responses that they currently experienced. The Author (1) read the scales to the illiterates and the responses selected by them were documented in the proforma.

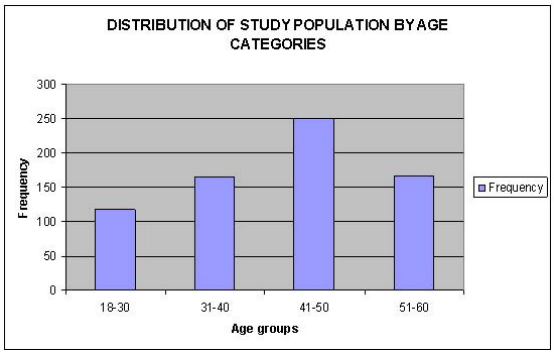
Piloting was done in the study area, involving 30 participants, to assess the feasibility of the study, which revealed 7 persons to be suffering from depression (23.3%) and among the seven, 5 were found to have mild and 2 had moderate depression.

All the 700 participants were given the *baseline questionnaire,* following which the 12-item General Health Questionnaire (GHQ) was administered to all the study participants. Scores above 3 were considered to be significant to detect psychiatric morbidity, if present. Since this instrument was highly sensitive as a first line screening device in the community, all those who had a GHQ score of more than 3, were given the second instrument, the 13 item Beck Depression Inventory Scale, which was used to diagnose and grade the depression, if present. This was applied as per the standard psychiatric norms and procedures.

STATISTICAL ANALYSIS was done by the authors by using the SPSS 12 Version.

RESULTS

Of the 700 study participants, 49.9% (349) were females and 50.1% (351) were males. The age of the study population ranged from 18 years to 60 years and the mean age was 42.4 years. The greatest proportion of the population belonged to the 41-50 years age group.[Table/Fig 1]



[Table/Fig 1]: Distribution of study population by age categories

PSYCHIATRIC MORBIDITY BY USING GHQ

The General Health Questionnaire was given to all the participants to assess them for the presence of psychiatric morbidity and if they were found to be having underlying psychiatric morbidity, the participants were then given the BDI scale.

Of the 700 study participants, 170 (24.2%) had psychiatric morbidity as per the GHQ and it was noted that the prevalence of the psychiatric morbidity was maximum between

41 – 50 years of age - 30.4% (n = 76) and minimum between 18 - 30 years of age -16.1% (n = 19).

93.6% (n = 160) of the people with psychiatric morbidity were found to have mild and moderate depression, according to the BDI. The overall prevalence of depression in the community was 22.8% (Mild depression being 20.7% and Moderate depression was 2.1 %.) No cases of severe depression were identified in the study. [Table/Fig 2]. For further calculations, the moderate and mild depression categories were combined.

[Table/Fig 2]: Number of people with depression identified with BDI scale

INFERENCE	BDI SCORE	FREQUENCY
No depression	0 – 3	11
Mild depression	4 – 7	145
Moderate depression	8 – 15	15
Severe depression	>15	0

From [Table/Fig 3], it is evident that the prevalence of depression is significantly higher among women overall and almost twice that of the men in all the age categories, which was statistically significant, except in the 18-30 age years group.

[Table/Fig 3]: Male to female comparison of depressed individuals

Age categories	Sex	Depression frequency (Percentage)	P value
18-30	Males(55)	6(10.9%)	**P>0.05**
	Females(63)	13(20.6%)	
31 – 40	Males(77)	9(11.6%)	
	Females(88)	25(28.4%)	**P<0.05**
41-50	Males(128)	26(20.3%)	**P<0.05**
	Females(122)	44(36.1%)	
51-60	Males(91)	14(15.3%)	**P<0.05**
	Females(76)	23(30.3%)	
TOTAL	Males(351)	55(7.85%)	**P<0.01**
	Females(349)	105(15%)	

Depression was found to be present in 60.5% of the people whose fathers had died before they reached the age of 16 years, while the prevalence was only 24.4% among the people whose fathers had died after they reached the age of 16 years. In those whose fathers were still alive, the prevalence of depression was 18.6%. Statistical analysis revealed a highly significant association between the loss of the father and presence of depression, with a much higher prevalence in people who had lost their father before they had attained 16 yrs of age. [Table/Fig 4]

Depression was found to be present in 59.6% of the people whose mothers had died before they reached the age of 16 years, while the prevalence was only 31.1% among the people whose mothers had died after they reached the age of 16 years.

[Table/Fig 4]: Relationship between loss of father and depression

Depression status	NO. Who had lost their father before attaining 16years	NO. Who had lost their father after attaining 16years	Father Alive	Total
Absent	17	155	368	540
Present	26	50	84	160
Total	43	205	452	700

P<0.001

In those whose mothers were still alive, the prevalence of depression was 18.5% [Table/Fig 5]

[Table/Fig 5]: Relationship between loss of mother and depression

Depression status	Died before 16 yrs	Died after 16 yrs	Alive	Total
Absent	19	62	459	540
Present	28	28	104	160
Total	47	90	563	700

P<0.001

The prevalence of depression in the married group was 20.2%. It was maximum in the group of being single after marriage (separated, divorced, widow or widower) (51.6%) and was found to be the least in the unmarried group (16.9%). The χ^2 analysis revealed a highly statistically significant positive association between being single after marriage and depression [Table/Fig 6].

[Table/Fig 6]: Marital Status and Depression

Marital status	No Depression	Depression present	Total
Unmarried	44	9	53
Married	465	118	583
Separated	1	1	2
Divorced	2	13	15
Widow	28	19	47
Total	540	160	700

p<0.001

In illiterates, 29.3% were found to be depressed, while the %s of depression were 21.3% in those who had education up to the high school level and 12.9% in those who had studied up to the higher secondary school or the college level. There was a statistically significant association between literacy status and the prevalence of depression. [Table/Fig 7]

Depression was present in 43.9% people with co morbid Diabetes Mellitus and

Hypertension, while it was seen only in 20.7% people without these two illnesses.

[Table/Fig 7]: Prevalence of Depression and Literacy status

Depression status	Illiterate	Up to high school	HSC & college	Total
Absent	147	339	54	540
Present	61	92	7	160
	208	431	61	700

P<0.01

There was a statistically significant difference in the prevalence of depression between people with these two co morbid illnesses and those without these two co morbid illnesses. [Table/Fig 8]

[Table/Fig 8]: Prevalence of depression with / without co morbidity

Depression status	No co morbidity	With co morbidity	Total
Absent	503	37	540
Present	131	29	160
	634	66	700

P<0.001

In our study, there was no statistically significant association between depression and smoking and consuming alcohol.

DISCUSSION

This study was conducted in the urban slum of ward 131 to estimate the cross sectional prevalence of depression in an urban slum at a community level.

The prevalence of depression in this study has been found to be on par with most of the studies which were conducted in India and outside India[18],[22],[23] &[24]

The overall prevalence of depression in the community was 22.85% (Mild depression being 20.71% and Moderate depression was 2.14 %.) No cases of severe depression were identified in the study. [Table/Fig 2]

The prevalence of depression in women was almost twice of that seen in men in all the age categories, which was statistically significant, except in the 18-30 years age group. This finding supports the previous findings that more women suffer with depression than men [25] &[26]

Loss of a parent or both the parents in childhood or before attaining 16 years of age, has been consistently implicated as a predisposing factor for depression by various studies across the world [27], [28] &[29] In our study also, the loss of fathers before the respondents reached the age of 16 years, had emerged as a statistically significant factor which was associated with depression, when compared with the loss of a parent after 16 years and the 'Father alive status'.

Similarly, loss of mothers before the age of 16 years also emerged as a statistically significant factor which was associated with depression, when compared with the loss of mothers after 16 years and the 'Mother alive' status.

When looking at the current marital status and depression, the population of single after marriage due to being separated or divorced, widows or widowers had a depression rate of 51.5% and a highly statistically significant association ($p < 0.0001$) was found between depression and being single after marriage. The lower prevalence of depression in the unmarried group and a higher prevalence in the group which was being single after marriage is consistent with the cross-cultural literatures which endorsed that marriage confers protection or prevents most of the mental illnesses viz. depression, stress and personality disorders[30],[31] & [32]. One of these studies revealed a lower rate depression in married individuals[30], while another reported higher rates of depression in divorced individuals than the married[31] and a 3rd one revealed lesser depression rates in those who were never married than in those who were being single after marriage[32] Though depression as a cause of being single after marriage was not studied, we can say that the likelihood of depression among those who were being together with their spouse was lesser than in those who were single after marriage in our study population.

A higher prevalence of depression among the illiterate participants and the lowest in the most educated group was observed in our study. A better level of education in this community was found to be associated with a lower prevalence of depression. A better employment and economic status due to higher

education might perhaps contribute to the difference in the depression rates.

A statistically significant association was present between the presence of diabetes and/or hypertension and depression, in our study. This association again is consistent with studies which were conducted, which revealed in India and outside India[33], [34] & [35], that there is a significant association between depression and co morbid conditions like diabetes and hypertension.

Studies in the past have implicated a poor socio economic status with depression. In our study, the highest level income group was Rs.1500 (Around 30 US Dollars per month) and above and it is unclear whether this is the true representation of their economic status, as the participants in the study did not file income tax forms, in which they were expected to reveal all their possible sources of income, perhaps due to ignorance or illiteracy. It is also doubtful whether these economical or occupational categories really classify the people in a way in which research could really benefit from it.

LIMITATIONS

- Persons aged more than 65 years could have been included after ruling out a cognitive deficit, if any.
- Biological correlates of depression like markers could have been studied to corroborate the diagnosis of depression.

CONCLUSION

Firstly, those participants in the study who were found to be suffering from depression were advised to attend the Psychiatry Out-patient's Block for appropriate treatment and the Multipurpose Health Worker was requested to follow them up, periodically.

There is huge case load of more than 20% unidentified depression cases in the community in our study. This, accompanied by the lack of an adequate health care system to detect and manage the same, brings forth the need for the following possible remedial actions.

- Active steps should be taken to train and sensitize the medical and paramedical personnel about identifying and managing depression in the primary care settings itself.
- Vulnerable groups like women, those who had lost their parents before attaining 16 years of age and those who are remaining single, must be identified and appropriate preventive measures or treatment should be given at the earliest suitable opportunity.
- Suitable IEC (Information, Education and Communication) activities must be formulated to sensitize the vulnerable population for seeking immediate mental health care, as and when the symptoms arise. Once the awareness increases, culturally appropriate treatment and technology must be made available to combat the morbidity which is caused due to depression.
- Policy makers can consider community participation with the involvement of Non-Governmental organizations, Self Help Groups or Public Private Partnerships, while planning to combat the common mental disorders like depression, as the mental health services are poorly developed in India.
- Co morbid physical illnesses along with depression, which are an emerging trend, must be taken into account while planning preventive and curative mental and physical health services.

As the cross sectional studies do not allow one to make causal assumptions, further researches should be conducted, for instance, to study the depression in females, while higher rates are reported across the world and it is essential to conduct researches on women's health that encompasses the holistic nature of health, viz., incorporating psychological, reproductive and social view points.

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