

## Mortality Among Inpatients of a Psychiatric Hospital: Indian Perspective

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### ABSTRACT


**Objective:** The objective of this study is to assess mortality and its correlates among psychiatric inpatients of a tertiary care neuropsychiatric hospital. Given the background that such a study has never been undertaken in India, the findings would have a large bearing on policy making from a mental health-care perspective. **Materials and Methods:** The medical records of those psychiatric inpatients ( $n = 333$ ) who died during their stay at the National Institute of Mental Health and Neurosciences in past 26 years (January 1983 to December 2008) constituted the study population. **Results:** During the 26 years, there were a total of 103,252 psychiatric in-patient admissions, out of which 333 people died during their inpatient stay. Majority ( $n = 135$ , 44.6%) of the mortality was seen in the age group of 21-40 years. Most of the subjects were males ( $n = 202$ , 67%), married ( $n = 172$ , 56.8%) and from urban areas ( $n = 191$ , 63%). About, 54% of the subjects had short inpatient stay (<5 days, median for the sample). In 118 (39%) of the subjects, there was a history of physical illness. Leading cause of death were cardiovascular system disorders ( $n = 132$ , 43.6%), followed by respiratory system disorders ( $n = 45$ , 14.9%), nervous system disorders ( $n = 30$ , 9.9%) and infections ( $n = 31$ , 10.1%). In 21 (7%), cause of death was suicide. **Conclusions:** Identifying the factors associated with the death of inpatients is of utmost importance in assessing the care in a neuropsychiatric hospital and in formulating better treatment plan and policy in mental health. The discussion focuses on the analysis of different factors associated with inpatient mortality.

**Key words:** Death, mortality, psychiatry, suicide

### INTRODUCTION

Mortality rates are used as global measures of a population's health status and as indicators of public health efforts and medical treatments.<sup>[1]</sup> Often the medical epidemiologist can gain valuable information

with therapeutic implications, from the study of mortality statistics. In psychiatric epidemiology, death is one of the important data points, which can be used more precisely for both research and service planning.<sup>[2]</sup> Mortality is still greater for psychiatric patients than expected, though it has decreased since the introduction of modern treatment and shorter duration of inpatient care. The mental hospital has traditionally provided primary psychiatric care and limited medical treatment, routinely referring patients with major physical illnesses to a general hospital.<sup>[3]</sup> High mortality rates among individuals with mental illness have been reported in various studies, but very little focus has been placed on the cause of death.<sup>[1]</sup> Epidemiological studies have consistently found excess mortality rates among individuals with serious mental

Access this article online	
<b>Website:</b> www.ijpm.info	<b>Quick Response Code</b> 
<b>DOI:</b> 10.4103/0253-7176.130974	

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illnesses (schizophrenia, schizoaffective disorder and bipolar and unipolar affective disorders) compared with the general population.<sup>[4,5]</sup> Felker *et al.* found that standardized mortality ratios for both natural and unnatural causes of death among psychiatric patients were more than twice that of the general population.<sup>[6]</sup> Other studies also reveal higher mortality in mentally ill in-patients than the general population.<sup>[3,7-10]</sup> Among the natural causes of death, infection ranked high and in unnatural causes of death, suicide was predominant. This study was undertaken with the objective of assessing mortality and its correlates among psychiatric inpatients of a neuropsychiatric institute in south India, given the background that such a study is lacking in India.

## MATERIALS AND METHODS

The medical records of those psychiatric inpatients ( $n = 333$ ) who died during their inpatient stay at National Institute of Mental Health and Neurosciences Hospital in past 26 years (January 1983 to December 2008) constituted the study population. Out of 333 psychiatric inpatient deaths, the researchers were able to trace and recruit the case record files of 303 inpatients. In this paper, we describe the analysis carried out on these 303 patients. Untraced files were submitted to various courts and for other legal purposes; hence such files were not reviewed. Along with demographic details, data about timing, inpatient stay duration, cause of death and medical co-morbidities were extracted from the case files. The socio-demographic and clinical characteristics data were analyzed. Further, the data was also classified into acute and chronic type inpatient stay by applying the median value.

## RESULTS

During the 26 years (January 1983 to December 2008), there were a total of 103,252 psychiatric inpatient admissions, out of which 333 people died during their in-patient stay. Majority of the subjects 202 (67%), were males. Table 1 outlines the socio-demographic profile. Maximum number of the subjects ( $n = 135$ , 44.6%), belonged to the age group of 21-40 years, followed by 99 (32.7%) in the age group of 41-60 years and very few, 5 (1.7%) in the age group of 80 years and above. The mean age of these subjects at the time of death was 41.84 years (standard deviation (SD)  $\pm 16.84$ ) and their age ranged from 5 years to 90 years. Among these subjects, majority ( $n = 172$ , 56.8%) of them were married, most of them, ( $n = 191$ , 63%) were from urban areas, 135 (44.6%) had no formal education, 56 (18.5%) were unemployed and 42 (14.2%) were chronic destitute subjects.

About 69 (22.7%) of the subjects had stayed as inpatients for less than 24 h i.e., they got admitted and died on the same day, 112 (37%) of them stayed as inpatients for less than one week, 72 (23.8%) of them stayed as inpatients for more than one week, but less than 3 months, 7 (2.3%) of them stayed as inpatients for more than 3 months, but less than 6 months, 3 (1%) of them stayed as inpatients for more than 6 months, but less than 1 year and 40 (13.2%) of them stayed as inpatients for more than 1 year. The mean number of days of inpatient stay was 1061.55 days (SD  $\pm 3068.32$ ) and the median was 5 days [Figure 1]. The

**Table 1: Demographic details**

Variable	Frequency	Percentage
Total number of inpatient deaths	333	
Number of inpatient death records reviewed	303	
Gender		
Male	202	67
Female	101	33
Age in years		
$\leq 20$	27	8.8
21-40	135	44.6
41-60	99	32.7
61-80	37	12.2
$\geq 80$	5	1.7
Marital status		
Unmarried	92	30.3
Married	172	56.8
Widow/divorced/separated	35	11.6
Data not available	04	1.3
Religion		
Hindu	263	86.8
Muslim	28	9.2
Christian	12	4.0
Residential status		
Urban	191	63.0
Semi-urban	27	8.9
Rural	83	27.4
Data not available	02	0.7
Educational status		
Illiterate	135	44.6
Primary	55	18.2
High school	60	19.6
Higher secondary	21	7.0
Under graduate	26	8.6
Post-graduate	06	2.0
Occupation		
Government employee/professional	28	9.2
Private firm employee	27	8.9
Agriculturist/daily wage labor	81	26.7
House wife	50	16.5
Not applicable	08	2.6
Retired employee	09	3.0
Unemployed	56	18.5
Chronic destitute	42	13.9
Data not available	02	0.7

number of in-patient days ranged from 0 to 16,389 days. The “0” days, indicates that subjects were inpatients for less than 24 h, i.e., subjects admitted and died on the same day. Hence a median value was used to classify inpatient stay into acute and chronic type inpatient stay, which was 5 days. About 164 (54%) of the subjects had short in-patient stay and 139 (46%) of the subjects had long inpatient stay. Table 2 shows

the yearly mortality rate per 1000 admissions. Similarly, averaged 5 year interval period mortality is depicted in Figure 2.

Twenty one (7%) subjects received no psychiatric diagnosis in the last admission prior to death, whereas 282 (93%) of the subjects had a psychiatric diagnosis. Among these subjects, 78 (25.7%) subjects had schizophrenia, 60 (19.8%) subjects had a mood disorder, 58 (19.1%) subjects had alcohol dependence/

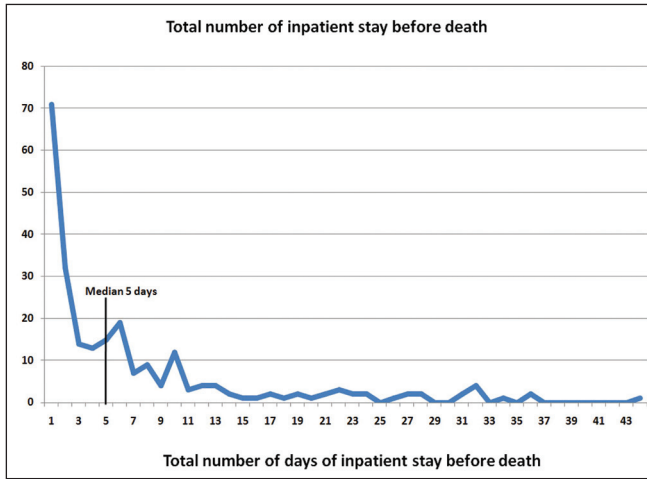


Figure 1: Total number of in-patient stay before death

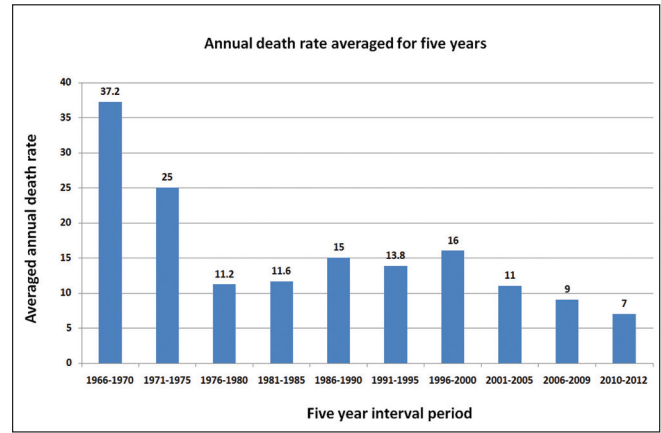


Figure 2: Annual death rate averaged for 5 years

Table 2: Annual mortality rate

Year	Total number of admissions per year	No. of psychiatric-inpatient deaths per year	Observed death rate (deaths per 1000 admissions; in present study)	Crude mortality rate of India (expected deaths; ED) (per 1000)	Standardized mortality ratio (OD/ED*100)
1983	3140	13	4.14	11.9	34.79
1984	2670	08	3.00	12.6	23.81
1985	2820	10	3.55	11.8	30.08
1986	2963	16	5.40	11.1	48.65
1987	3254	09	2.77	10.9	25.41
1988	3253	17	5.23	11.0	47.55
1989	3316	20	6.03	10.3	58.54
1990	3201	13	4.06	9.7	41.86
1991	3360	06	1.79	9.8	18.27
1992	3652	24	6.57	10.1	65.05
1993	4357	13	2.98	9.3	32.04
1994	4748	09	1.90	9.3	20.43
1995	4659	17	3.65	9.0	40.56
1996	4527	14	3.09	9.0	34.33
1997	4258	14	3.29	8.9	36.97
1998	4645	18	3.88	9.0	43.11
1999	4443	18	4.05	8.7	46.55
2000	4322	16	3.70	8.5	43.53
2001	4399	07	1.59	8.4	18.93
2002	4200	08	1.90	8.1	23.46
2003	4236	13	3.07	8.0	38.38
2004	4119	15	3.64	7.5	48.53
2005	4372	12	2.74	7.6	36.06
2006	4301	06	1.40	7.5	18.67
2007	5019	08	1.59	7.4	21.49
2008	5034	09	1.79	7.4	24.19
Total	1,03,252	333			

OD – Observed death; ED – Expected deaths

withdrawal syndrome, 34 (11.2%) had organic mental disorder, 26 (8.6%) subjects had unspecified psychosis, 17 (5.6%) subjects had mental retardation, 6 (2%) of subjects had neurotic stress related and somatoform disorder and 3 (1%) had other substance use disorder as their psychiatric diagnosis in the last admission prior to death.

Table 3 shows the distribution of cause of death and type of cause of death as mentioned in the death report. In 118 (39%) subjects, there was a history of physical illness during admission. Among these subjects the major health concerns were cardiovascular disorders ( $n = 15$ , 5%), respiratory system disorders ( $n = 21$ , 7%), neurological disorders ( $n = 34$ , 11.2%), endocrine disorder ( $n = 14$ , 4.7%), gastro intestinal system disorder ( $n = 7$ , 2.3%), hematological disorder ( $n = 2$ , 0.7%), musculoskeletal and connective tissue disorder ( $n = 1$ , 0.3%), human immunodeficiency virus positive ( $n = 8$ , 2.6%) and tuberculosis ( $n = 4$ , 1.3%).

Leading cause of death was cardiovascular system disorders ( $n = 132$ , 43.6%), followed by the respiratory system disorders ( $n = 45$ , 14.9%), nervous system disorders ( $n = 30$ , 9.9%) and infections ( $n = 31$ , 10.1%). In 21 (7%), cause of death was suicide. Twelve (4%) committed suicide (hanging) within the hospital and remaining 9 (3%) attempted suicide (7 poisoning and 2 hanging) outside the hospital before hospitalization, but died during the hospital stay.

## DISCUSSION

Bengal enquiry of 1818<sup>[11]</sup> indicated that the mental health-care was suboptimal and hence there were numerous deaths occurring in asylums. However, the enquiry did not mention the statistics of mortality in mental hospitals and hence the data of this kind from India is sparse. The mean age of the subjects in the study was 41.84 years and the maximum death occurred in the age group of 21-40 years (44.6%), which

are similar to the earlier findings by Malomo *et al.*<sup>[12]</sup> and Honkonen, *et al.*<sup>[13]</sup> Our findings are consistent with earlier studies<sup>[3,13]</sup> in the context that mortality among men was higher. More than half of the deceased had been admitted for a week or even more recently, a period that can be considered as a crucial period for the subjects. An earlier study finding reflected that about 72% of subjects died within two weeks of hospitalization while 5.2% were chronic patients who were staying over 5 years in hospital.<sup>[12]</sup> The overall standardized mortality rate (SMR) of 26 years of death is 0.356, which shows that the inpatient mortality is considerably lesser than crude mortality rate of India. Our findings of the study are in contrast with the studies conducted by Lim *et al.*<sup>[7]</sup> who reported mortality in in-patient to be 2.79 times more than that of the general population mortality. Similarly, Amaddeo *et al.*<sup>[8]</sup> also reported the overall SMR for their study subjects was 1.63, which is more than that of the general population. One of the important reasons for decreased mortality can be attributed to the hospital policy, which insists that a family member stays with the patient during the treatment process. This helps the treating doctor to enable and empower family members in providing appropriate care to the patients both during the in-patient stay and also when the patient is back to the community. The family members would not only ensure protection of the rights of the patients, but also communicate to the treating team about the distress of the patient in greater detail.

Nearly, 93% of the subjects were diagnosed to have psychiatric illness and majority of them (25.7%) were diagnosed with schizophrenia followed by mood disorder (19.8%). These two disorders accounted for almost half of the diagnosis of whole population. This diagnostic composition among persons who died in in-patient psychiatric setting is similar to that in the earlier studies.<sup>[7,12]</sup> Many were diagnosed to have a medical illness prior to death similar to earlier study findings.<sup>[7]</sup> Among the causes of death, the leading one was cardiovascular disorders (43.6%), followed by the respiratory system disorder (14.9%) which is similar to causes described in the literature.<sup>[3,7]</sup> Twenty one (6.9%) subjects died because of suicide and among them, diagnosis was predominantly schizophrenia and mood disorder, which is consistent with available literature.<sup>[14-17]</sup>

The issue of death during custodial care of a mentally ill-patient is not an uncommon scene in developing countries. Death of mentally ill-patients should be considered carefully. The following are the factors, which can contribute to increased mortality<sup>[18,19]</sup> (a) lack of manpower (doctor/nurse/attender to patient ratio), (b) absence of training of the other (non-medical)

**Table 3: Cause of deaths**

Variable	Frequency (n=303)	Percentage
Type of cause of death		
Not mentioned	3	1.0
Cardiovascular disorders	132	43.6
Respiratory system disorders	45	14.9
Nervous system disorders	30	9.9
Gastrointestinal system disorders	10	3.3
Genitourinary system disorders	03	1.0
Infections	31	10.1
Drug related complications	20	6.6
Delirium tremens	11	3.6
Hanging	12	4.0
Miscellaneous	06	2.0

staff on how to restrain a violent patient, (c) mentally ill-patients are most vulnerable to any physical illness, (d) disease outbreaks are common in mental hospitals, (e) non-availability of life saving medicines and general medicines, (f) poor protective clothing as per the local weather/environment, (g) violence among the inmates and (h) suicide or deliberate self-harm. Death of mentally ill-patients does occur because of negligence of the staff also. However, many of the mental hospitals in India do follow good clinical practice by conducting a postmortem to ascertain the cause of death of the patient. This issue of good clinical practice should be fostered.<sup>[19]</sup>

The most important limitation of this study is the record-based design, which relies on the data in charts. However, since death is a very important event recorded in any hospital, the record on the details of death was well-documented.

In conclusion, this study brings to light the important parameters that are associated with inpatient death. It calls for thorough and regular examination of patients for medical conditions. It also demands better liaison services with medical and neurological departments since psychiatric patients can have high medical comorbidities. Priority care must be exercised, anticipating medical emergencies in patients who already have medical illnesses and hence the need for routine and meticulous medical screening and documentation. One important preventable cause of death in an in-patient setting would be suicide. Better nursing care, intense supervision of patients with risk of self-harm, rapid and intensive treatment and regular monitoring for suicidal tendencies in patients form the cornerstone in preventing such untoward instances in the hospital. An estimate of mortality in the hospital over more than 25 years is provided in this study. Identifying the factors associated with death of in-patients is of utmost importance in assessing the care in a psychiatric hospital and in formulating better treatment plan and policy in mental health.

## ACKNOWLEDGMENT

We thank Mr. Pulla Reddy, the Chief Medical Records Officer, Medical Records Section, NIMHANS, for his kind cooperation and help which made this study possible.

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**How to cite this article:** Shinde SS, Nagarajaiah, Narayanaswamy JC, Viswanath B, Kumar NC, Gangadhar BN, et al. Mortality among inpatients of a psychiatric hospital: Indian perspective. *Indian J Psychol Med* 2014;36:142-6.

**Source of Support:** Nil, **Conflict of Interest:** None.