A Ten-Year Perspective of Mortality Risk Among Mentally Ill Patients in Sheltered Care

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Abstract

The ten-year risk of mortality was assessed for a sample of 393 former psychiatric patients who were living in sheltered care settings in California in 1973. Compared with the general state population, residents of sheltered care facilities were 2.85 times more likely to die than would be expected if age-specific rates for the state applied to them. Excess mortality was due to heart disease, cerebrovascular diseases, and all other natural and unnatural causes except malignant neoplasms. The mortality rate of the subjects was closer to that of a low-income subsample of the California population, suggesting that the high mortality rates of patients in sheltered care settings may be due to their low-income status.

During the past 25 years, numerous studies, conducted both in the United States and abroad, have examined the risk of mortality among psychiatric patients. Without exception, studies have found that inpatients (1–10) and outpatients (11–15) have a higher risk of mortality than the general population. These studies typically identified their cohorts using the criterion of one experience of psychiatric treatment, either as an inpatient or an outpatient. Thus even when subjects were identified on the basis of diagnosis, these cohorts encompassed people with a wide range of disability.

In this study, we examined mortality risk among people whose psychiatric disabilities and lack of family support were serious enough to require them to live in a sheltered care facility. Deinstitutionalization has been associated with a decrease in the mortality risk of still-hospitalized patients (16,17), but the mortality risk of the large number of psychiatric patients who now live in sheltered care settings is not known.

Sheltered care facilities include board-and-care homes, family care homes, halfway houses, and psychosocial rehabilitation facilities—in short, all supervised living arrangements for mentally ill patients, excluding licensed hospitals. Board-and-care and family care homes house 97 percent of the sheltered care population and constitute 98 percent of available facilities (18).

Sheltered care offers several advantages over either direct community placement or placement in a state mental hospital. Compared with direct community placement, sheltered care allows for a relatively normalized living environment that protects former patients from the day-to-day crises they are prone to experience when they are on their own. Because these

facilities provide 24-hour supervision, residents are eligible to receive the higher rate of Supplemental Security Income designated for protected living arrangements. Compared with the hospital, sheltered care facilities offer a wider range of living environments that may be better able to meet patients' individual needs.

This paper addresses three issues related to the mortality of psychiatric patients in sheltered care. First, do former psychiatric inpatients who once lived in a sheltered care setting have a higher mortality rate than people in the general population or a low-income subsample of the general population? Second, are cause-specific mortality rates higher among these patients than in the general population? And third, are psychiatric diagnoses associated with specific causes of death?

Methods

Sources of data.

Data for this research were collected as part of a larger prospective study of 393 people with a history of psychiatric hospitalization who lived in 211 sheltered care facilities in California. The patients studied and the facilities in the sample are representative of their respective populations. Details of the sampling and study procedures have been reported previously (18,19). The first round of data collection occurred in 1973, and a second round took place from 1983 to 1985. Table 1 presents 1973 data on characteristics of the 393 patients.

Of the original 393 residents, 270 (68.7 percent) were alive and 90 (22.9 percent) were dead at the time of follow-up. There were no significant differences in the age, gender, ethnicity, or marital status distribution between those who were located (91.6 percent of the sample) and those who were not (8.4 percent). We searched both in California and in other states for death certificates for all unlocated persons. People who were not located were assumed to be alive for the purposes of this analysis.

Data on cause of death were obtained from each death certificate. Problems with the accuracy of diagnoses often arise when death certificates are used as a source of data about cause of death. These problems have been well documented elsewhere (20,21), and there is no reason to suspect that they are of greater magnitude in this study than in others.

Primary psychiatric diagnoses were obtained for 295 of the 393 people in the cohort. These data were derived from records of 1,070 separate episodes of mental hospitalization acquired from 119 hospitals. Interrater agreement for coding the specific beginning and ending dates for episodes of psychiatric hospitalization and episode discharge diagnoses was 91 percent and 96 percent, respectively. Thirty-eight percent of these diagnoses were made using criteria from *DSM-III*, 44.2 percent using criteria from *DSM-II*. and 17.8 percent using criteria from *DSM-I*. From these diagnoses, a modal diagnosis for each individual was coded. If a modal diagnosis could not be determined, the most recent diagnosis was used.

Statistical analysis.

Standardized mortality ratios (SMRs) were computed to compare the deaths observed in our sample with mortality rates for the state of California for 1980. The statewide rates were derived by putting either the total number of deaths or the number of deaths due to a specific cause in each age and gender category in the numerator, and the estimated midyear number of people in the state in the appropriate age and gender category in the denominator. These rates were then multiplied by the total number of person-years in the observed age and gender categories to derive an expected number of deaths. The observed number of deaths was then divided by the expected number of deaths to obtain an SMR. The significance of the SMR was tested against a chi square distribution with one degree of freedom when the expected number of deaths was greater than or equal to five and by a Poisson distribution when the expected number of deaths was less than five (22).

This same procedure was used to compare deaths in the sheltered care sample with a low-income subsample of the California population (23), except that the expected rates for the low-income sample were derived from a person-year analysis. The observed number of deaths in the low-income sample was divided by the number of person-years during the ten-year study.

Data for the low-income sample were obtained from the Human Population Laboratory data base, which is maintained by the California Department of Health Services. The data were generated from a stratified, systematic sample of housing units in Alameda County in 1965. The original 6,928 people in that sample were followed through 1985 to ascertain their mortality status. The average income of the 1,426 people in the low-income subsample was $1,375 per year or $113 per month (personal communication, Camacho T, 1988), somewhat lower than the $162 received by sheltered-care residents from the Aid to the Totally Disabled (ATD) program (that is, the program that was the immediate precursor to the Supplemental Security Income program).

Results

Deaths (22.9 percent of the sample) were spread evenly over the study interval, with 26.7 percent of the 90 deaths occurring during the first three years. The mean survival time for subjects who died was 66.8 months.

In comparing California's 1973 sample of sheltered care residents with a subset of subjects, matched for geographic location and disability, from a 1983 national study of sheltered care residents, we observed no differences in the age or gender composition of the two samples (24). It thus appears that the age and gender composition of the sheltered care population between 1973 and 1983 was stable—a fact that makes our findings more easily generalizable to today's population.

Total mortality compared with the general population.

The standardized mortality ratio (SMR) for the sheltered care population compared with the general population of California in 1980 was 2.85. People in sheltered care were dying at 2.85 times the rate that would be expected if the age-specific rates for the state applied to

them. Table 2 shows that SMRs for the sheltered care population were significantly elevated for all age and gender categories except men between the ages of 18 and 45. The SMR for women aged 18 to 45 years was substantially higher than that for other groups identified by both age and gender. It must be noted, however, that there were only six deaths in this group.

Cause-specific mortality.

As Table 3 shows, the sheltered care group and the general population did not differ in the proportion of deaths due to specific causes. Table 4 presents the age-standardized mortality ratios by cause of death for men and women separately. When the rates were corrected for age, more deaths than expected occurred due to heart disease, cerebrovascular disease, and all other natural causes. Although the rates of deaths due to cancer or unnatural causes were not excessive among either men or women when calculated separately, the SMR for unnatural causes of death was significantly elevated for the entire sample (SMR=2.5, χ^2=7.4, df=1, p<.05).

Comparisons with a low-income subsample of the general population.

The above analyses show that mortality rates were higher in the sheltered care psychiatric population than in the general population of the state; however, they do not explain the higher rates. A major difference between the sheltered care residents in our sample and the population of the state is the poverty of our sample. Although exact income figures from 1973 were not available, most of the sample reported that ATD was their sole source of income, and only 10 percent said they had any private income from family, employment, or investments.

To test the hypothesis that mortality differentials between the general population and psychiatric populations are due less to psychiatric disorder and more to the poverty of psychiatric patients, mortality rates from a sample of low-income residents of Alameda County, California, were obtained.

As shown in Table 2, the SMR for the sheltered care residents compared with the low-income group was 1.82. This ratio is significantly different from 1 but is substantially reduced from the SMR of 2.85 obtained in the comparison with the California general population. Most of the reduction was found among men and women between the ages of 46 and 65, suggesting that some of the excess mortality in this group was due to their low-income status. The same trend was not observed for younger residents of sheltered care facilities. For residents between the ages of 18 and 45, the SMR was about 3.9 in the comparison with both the general population of California and the low-income subsample (Table 2).

Specific causes of death.

We examined the relationships between available psychiatric diagnoses and subsequent mortality. No significant relationship existed between mortality and the probability of identifying a psychiatric diagnosis from the records. We obtained a diagnosis for about 76 percent of both the living and the deceased members of the sample.

Modal lifetime diagnoses for 256 of the 295 patients were obtained from inpatient records; data for the remaining 39 patients were obtained from outpatient records. Lifetime diagnoses were paranoid schizophrenia for 73 patients (24.7 percent), other types of schizophrenia for 135 patients (45.8 percent), affective disorder for 14 patients (4.7 percent), organic mental disorder for 23 patients (7.8 percent), alcohol or drug abuse for 28 patients (9.5 percent), and other disorders for 22 patients (7.5 percent). A total of 70.5 percent of the people in the study had a modal lifetime diagnosis that fell within the spectrum of schizophrenic disorders.

Table 5 gives the SMRs by diagnostic categories for the sheltered care residents compared with both the California general population and the low-income subsample. All gender and diagnostic groups, except for men with schizophrenic disorders, showed increased mortality relative to the general population and to the low-income sample.

Because deaths from heart disease were excessive, the SMR for deaths from heart disease was also computed for men and women with and without schizophrenic disorders. Among the 109 schizophrenic men, there were 11 deaths from heart disease. Since only 2.6 deaths would have been expected, given the age distribution of the sample and the rate of mortality from heart disease in California, the SMR for the group was 4.1 (χ^2=13.22, df=1, p<.05). Among the 99 schizophrenic women, there were seven deaths, for an SMR of 4.79 (χ^2=9.63, df=1, p<.05). For nonschizophrenic men, the SMR was 4.34 (χ^2=9.63, df=1, p<.05). There were no deaths from heart disease among the 33 nonschizophrenic women. Among people with schizophrenic disorders, the majority of deaths from heart disease were from ischemic heart disease (*ICD-9* codes 410 to 414) and occurred after age 46.

Discussion

Former psychiatric inpatients who live in sheltered care facilities have a significantly higher risk of mortality than the general population in the state of California. The overall SMR for the residents was 2.85—somewhat higher than the SMR of 2.3 reported in a recent study of 1,033 public mental hospital inpatients (25). The overall SMR in our study is somewhat lower than the SMR of 3.4 observed for patients in a general psychiatric aftercare program (11).

Mortality risk was significantly elevated for all age and gender groups, except for men aged 18 to 45, and for all causes of death except malignant neoplasms and unnatural causes. If data for men and women were combined, the SMR for unnatural deaths was significantly elevated. However, only eight unnatural deaths occurred in the sample: four accidents, three suicides, and one homicide. Two of the accidents and one of the suicides were among women; the other deaths were among men. This number of unnatural deaths is substantially smaller, especially for men, than has been reported in other studies (2).

One possible explanation for the reduced number of unnatural deaths is that sheltered care operators tend not to admit young psychotic male patients, who are more likely to act out and most likely to die an unnatural death. Both Lamb (26) and Minkoff (27) have commented that the existing treatment system is not responsive to the needs of young male

chronic patients because the system requires them to define themselves in a dependent role, a role that many of these patients have not been socialized to accept. The sheltered care industry is likely to have the same selection bias. Second, to the extent that young male chronic patients have remained in sheltered care, it is plausible that the environment is a protective one and prevents acting-out behavior that leads to suicides, accidents, or homicides.

Recent studies have attempted to relate specific psychiatric diagnoses to specific causes of death, on the assumption that demonstration of a more specific relationship will lead to the discovery of a common etiological factor. Like Herrman and associates (28) and Black and associates (3), we found a significantly elevated risk of death from heart disease among schizophrenic patients. However, we also found an elevated risk of death from heart disease among nonschizophrenic men and, unlike Black and associates, we found that deaths from heart disease did not occur solely among women. While the specificity hypothesis may yet prove fruitful, the results of this study and the inconsistent results of others (4,5,15,25,27–30) certainly do not support this hypothesis.

We would like to suggest that there are a number of less direct ways in which psychiatric illness may be associated with increased risk of mortality. We examined one alternative explanation—poverty. Numerous studies have demonstrated an increased risk of mortality from all causes among poor populations (31–34). Our sample is certainly poor, as are many psychiatric patients. We found that mortality risks in our sample were much closer to those of the low-income sample than to those of the general population. This finding suggests that some, if not most, of the increased risk among psychiatric patients could be due to their poverty. The mortality risks of the low-income sample and our sample are most similar for persons aged 46 to 65, and they are not significantly different for women.

Psychiatric illness may also be causally related to mortality through the mechanism of poor health habits. This study did not examine the role of health behaviors in relation to mortality; this relationship is an important area of future research. Many studies have examined health behaviors and life-style factors in community populations as predictors of mortality, particularly from circulatory diseases (23,35,36). These studies demonstrated excess mortality associated with smoking habits, lack of exercise, poor dietary habits, and lack of meaningful contact with friends and the community. Psychiatrically disabled persons are no less susceptible to the ill effects of these factors than the general population. The prevalence of poor health habits among chronic mentally ill patients may be considerably higher than in the general population (37–40) and could explain their increased mortality risk.

Finally, people with co-existing physical and psychiatric illness are more likely to live in sheltered care settings (or mental hospitals) than are people with psychiatric illness alone. The increased mortality risk found in our sample (and previous studies of hospitalized patients) may be an artifact of the selection process. This possibility suggests the need for studies that concurrently and comprehensively assess patients' physical and psychiatric status and for epidemiological studies that examine the risk of mortality among people with psychiatric illness, independent of their living status.

Conclusions

Our analysis shows that former psychiatric inpatients who once lived in sheltered care facilities have a significantly higher risk of mortality than the general population of California. However, we found that a portion of this increased risk, especially for patients between the ages of 46 to 65, may be due to the population's low-income status. This finding suggests that previous studies may have overestimated the amount of excess risk attributable to psychiatric disorder. We suggest that the excess of natural death in the sheltered care sample is due to several causes. Our data do not support the idea that specific psychiatric disorders are related to specific causes of death.

Acknowledgments

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Table 1

Characteristics of chronic mentally ill patients (N=393) living in sheltered care facilities in California in 1973, in percentage of patients

Characteristic	Total	Male	Female
Age (years)[1]			
18 to 35	27.0	33.5	18.3
36 to 45	15.5	15.2	16.0
46 to 55	30.3	24.6	37.9
56 to 65	27.2	26.8	27.8
Ethnic group			
Black	13.0	12.1	14.3
White	76.0	76.7	75.0
Other	11.0	11.2	10.7
Years of education			
None to six	9.6	9.1	10.2
Seven to 12	66.8	63.9	70.7
13 or more	23.6	26.9	19.2
Marital status[2]			
Single	58.1	71.6	40.2
Married	4.9	4.5	5.3
Formerly married	37.1	23.9	54.4
Employment and income			
Works for cash or other benefits			
Never	73.6	72.1	75.4
At least rarely	26.4	27.9	24.6
Has had continuous full-time employment for a year or more[3]			
Yes	66.9	71.3	61.3
No	33.1	28.7	38.7
Has spending money			
None	7.6	8.6	6.3
Some	92.4	91.4	93.8
Psychiatric treatment			

Characteristic	Total	Male	Female
Months in current sheltered care facility [4]			
One	5.6	8.1	2.5
Two to 12	35.8	38.9	31.7
13 to 24	18.0	14.2	23.0
25 or more	40.6	38.9	42.9
Has spent a continuous period of two or more years in a state psychiatric hospital [5]			
Yes	40.5	36.3	46.1
No	59.5	63.7	53.9
Psychiatric admission in the past year			
Yes	21.7	20.5	23.4
No	78.3	79.5	76.6
Currently receives psychiatric treatment			
Yes	29.0	28.0	30.2
No	71.0	72.0	69.8
Takes an antipsychotic medication [6]			
Yes	73.3	67.4	81.5
No	26.7	32.6	18.5

[1] Significant difference between males and females in age distribution (χ^2=13.90, df=3, p=.003)

[2] Significant difference between males and females in marital status (χ^2=40.58, df=2, p=.000)

[3] Males were significantly more likely to have had continuous, full-time employment for a year or more (χ^2=4.26, df=1, p=.045).

[4] Significant difference between males and females in length of time in current sheltered care facility (χ^2=10.59, df=3, p=.011)

[5] Males were significantly less likely to have been hospitalized for two or more continuous years (χ^2=3.71, df=1, p=.05).

[6] Females were significantly more likely to take an antipsychotic medication (χ^2=9.28, df=1, p=.002).

Table 2

Standardized mortality ratios (SMRs) for patients in sheltered care, by gender and age, calculated in comparison with rates for the California general population (1980) and a low-income subsample [1]

Gender and age category	SMR, California comparison	$\chi^{2\dagger}$	SMR, low-income comparison	$\chi^{2\dagger}$
Total sample (N=393)	2.85	107.88 *	1.82	33.10 *
Gender				
Men (N=224)	2.82	68.29 *	1.69	16.19 *
Women (N=169)	2.78	36.49 *	1.65	8.35 *
Age group				
18 to 45 years (N=177)	3.83	23.02 *	3.98	24.06 *
46 to 65 years (N=216)	2.75	87.98 *	1.68	22.20 *
Gender and age group				
Men 18 to 45 years (N=113)	1.96	2.36	2.14	3.05
Men 46 to 65 years (N=111)	2.94	68.07 *	1.65	13.75 *
Women 18 to 45 years (N=64)	8.86	41.83 *	8.10	37.40 *
Women 46 to 65 years (N=105)	2.39	21.11 *	1.40	2.98

[1] N=1,426 for the low-income subsample. Data from a 1965-to-1985 follow-up study conducted by the Human Population Laboratory in Alameda County, California

$\dagger$ df=1

* p<.05

Table 3

Causes of death in the general population of California (1980) and among residents of sheltered care facilities, in percentage of deaths[1]

Cause of death	California	Sheltered care[2]
Heart disease	35.5	44.4
Malignant neoplasms	21.6	14.4
Cerebrovascular disease	9.0	11.1
Accidents	5.8	4.4
Suicide	1.8	3.3
Homicide	1.8	1.1
All other causes	24.5	21.3
Total	100.0	100.0

[1] χ^2=6.33, df=6, ns

[2] Total number of deaths in the sample was 90.

Table 4

Causes of death and standardized mortality ratios (SMRs) among patients in sheltered care (N=393)

Cause of death	Men			Women		
	N deaths	SMR	$\chi^{2\dagger}$	N deaths	SMR	$\chi^{2\dagger}$
Heart disease	30	4.10	10.6*	10	3.69	10.52*
Malignant neoplasms	8	1.48	0.8	5	0.89	0.20
Cerebrovascular disease	5	6.69	8.9*	5	7.60	9.90*
Other natural causes	10	2.27	4.7*	9	3.26	7.90*
Unnatural causes [1]	5	1.86	1.2	3	4.10	3.10

$\dagger$ For sample SMRs calculated in comparison with rates for the California general population, df=1

*
p<.05

[1] Includes suicide, homicide, and accidental death

Table 5

Standardized mortality ratios (SMRs) for patients in sheltered care calculated in comparison with rates for the California general population and a low-income subsample, by gender and diagnosis

Gender and diagnostic group	SMR, California comparison	$\chi^{2\dagger}$	SMR, low-income comparison	$\chi^{2\dagger}$
Men				
Schizophrenic disorders (N=109)	2.36	14.84*	1.55	3.72
All other diagnoses (N=54)	4.13	54.06*	2.30	16.90*
Women				
Schizophrenic disorders (N=99)	2.68	17.96*	1.61	3.98*
All other diagnoses (N=33)	3.41	14.10*	2.02	4.00*

†df=1

*p<.05