

Epidemiological Study on Relationship between Mental Health (Depressed Patients) and Social, Economic and Cultural Factors in Japan

**Akio SHIMOZAKI^{*1}, Masahide IMAKI^{*1}, Yukie YOSHIDA^{*1},
Manabu KITAKOUJI^{*2} and Seiki TANADA^{*2}**

**1: Department of Clinical Nutrition, Faculty of Comprehensive Rehabilitation,
Osaka Prefecture University*

**2: Faculty of Pharmaceutical Sciences, Kinki University*

Abstract

In this study, the correlations between the number of patients with depression (stratified by prefecture) and 75 metrics, including salaries, earnings, expenditures, time schedules, education and medical expenses were analyzed to evaluate the number of patients and the socio-economic-cultural factors comprehensively. The details are reported below.

From the correlations with the labor situation and economic factors, it was noted that there are fewer depressed patients in those areas where individual incomes and total cash wages are high and total working hours are short. Thus it was presumed that the economic situation is positively related to the number of depressed patients. Next, the correlation with daily monetary consumption indicated that fewer depressed patients are found in those areas where area-related price differences are large and the people spend more for education and cultural entertainment. The correlation with daily time schedules showed that fewer people are affected by depression in those areas where people spend more time commuting to work or school and less time for rest and sleep. For educational status, fewer people suffered from depression where more people went to universities. A tendency was noted for the local incidence of depression to increase proportionally with a rise in medical expenses.

The results presented above can be summarized as follows: fewer depressed patients are found in those areas where a good economic situation prevails; a greater amount of money is expended for education and cultural endeavors; and the educational level is high.

Key words : mental health, depressed patients, social, economic and cultural factors

I . Introduction

Japan is fast approaching an ultra-aged society and “nursing prevention” has been attracting attention to keep the aged in a state that is independent on nursing care. Policy planning for nursing prevention is important not only to assure the aged QOL but also for medical economics. Thus it is essential to investigate factors-such as “depression,” “falls,” “shut-in,” “oral hygiene,” “nutritional status,” “involvement in hobby” and “interpersonal relations (such as social support)” – from a broad viewpoint and establish the evidence that is necessary for policy planning to prevent nursing

dependency. Among these factors, “depression” has been cited as one of the prime factors in preventing a state that is reliant on nursing. Its management has been discussed at a local legislative level and an analysis of regional differences in “depression” is likely to be important ¹⁾.

It has been reported that the factors responsible for regional differences in health are related to the socioeconomic characteristics of the area. There is a report on the relationships among the social strata expressed by educational level, income, occupation, morbidity and mortality ; and another on the exaggeration of the gap in health level among different social strata in western countries. Health has

traditionally been interpreted based on a “biomedical model”²⁾, which explains human beings from a biological aspect. However, this model has been found to be inadequate in explaining the current situation: a man is a biological being as well as a social organism with an ability to think. Thus a “biopscho-social model”³⁾ — that emphasizes a man’s interaction with the environment and explains a man comprehensively and holistically in his environment-has been attracting attention.

In Japan country, there have been occasional studies of this nature, mostly on regional differences in mortality or the incidence of suicides with special references to regional socioeconomic states; but there are many unanswered questions⁴⁾. In particular, following the economic bubble burst, notable social changes were brought about, exaggerating the gaps among social classes. In such a situation, it is necessary to conduct a detailed study on the relationship between socioeconomic status and gaps in health status.

In the current study, the correlations between the number of patients with depression (stratified by prefecture) and 74 metrics, including salaries, earnings, expenditures, time schedules, education and medical expenses were analyzed to evaluate the number of patients and the socio-econo-cultural factors comprehensively. The details are reported below.

II. Subject and Method

1. Materials for the analyses

- 1) Target index data : The number of patients with depression (from the Medical White Paper 2006)⁵⁾
- 2) Explanatory index data : social, economic and cul-tural factors (Kensei 2007)⁶⁾
 - (1) Labor force data : ① Percentage labor force (overall), ② Percentage labor force (males), ③ Percentage labor force (females), ④ Percentage of those who are employed (overall), ⑤ Percentage of those who are employed (males), ⑥ Percentage of those who are employed (females), ⑦ Percentage of those who are totally unemployed (overall), ⑧ Percentage of those who are totally unemployed (males), ⑨ Percentage of those who are totally unemployed (females), ⑩ Total hours of work (establishments employing 30 or more) (Industrial Survey)*2, ⑪ Total hours of work (establishments employing 30 or more) (manufacturing)*2, ⑫ Total hours of work (establishments employing 5 or more) (Industrial Survey)*2, ⑬ Total hours of work (establishments employing 5 or more) (manufacturing)*2, ⑭ Total cash payment (establishments employing 30 or more) (Industrial Survey)*2, ⑮ Total cash payment (establishments employing 30 or more) (manu-

facturing) *2, ⑯ Total cash payment (establishments employing 5 or more) (Industrial Survey) *2, ⑰ Total cash payment (establishments employing 5 or more) (manufacturing)*2

- (2) Finance data : ① Income per prefectural resident (1990) *2, ② (1995)*2, ③ (2000) *2, ④ (2003) *2, ⑤ Balance of savings per person, ⑥ Amount of insurance *4
- (3) costs data : ① Region-specific consumer price index (comprehensive) *3, ② (food) *3, ③ (overall excluding rent) *3, ④ Quantities of food purchased per year (rice) *4, ⑤ (bread) *4, ⑥ (fresh seafood) *4, ⑦ (beef) *4, ⑧ (pork) *4, ⑨ (butter) *4, ⑩ (fresh vegetabl), ⑪ (fresh fruits) *4, ⑫ Income and expenditures of a working family (actual income) *5, ⑬ (actual expen-diture)*5, ⑭ (food) *5, ⑮ (housing) *5, ⑯ (heat, electricity and water) *5, ⑰ (clothing and shoes) *5, ⑱ (health care) *5, ⑲ (transportation and communication) *5, ⑳ (education) *5, ㉑ (cultural entertainment) *5, ㉒ (entertainment) *5, ㉓ (taxes and others) *5
- (4) Personal time allocation data : ① Personal time allocation within a day (males) (sleep), ② (males) (meals), ③ (males) (commuting to work or school), ④ (males)(work), ⑤ (males) (housework), ⑥ (males) (TV, radio, newspaper, magazine), ⑦ (males) (rest and relaxation), ⑧ (males) (hobby and entertainment), ⑨ (males) (sports), ⑩ Personal time allocation within a day (females) (sleep), ⑪ (females) (meals), ⑫ (females) (commuting to work or school), ⑬ (females) (work), ⑭ (females) (housework), ⑮ (females) (TV, radio, newspaper, magazine), ⑯ (females) (rest and relaxation), ⑰ (females) (hobby and entertainment), ⑱ (females) (sports)
- (5) Education data : ① Percentage of high school graduates selecting various options (males) (universities), ② (vocational schools), ③ (employment), ④ Percentage of high school graduates selecting various options (females) (universities), ⑤ (vocational schools), ⑥ (employment)
- (6) Medical care: ① National Health Care Expenditure: medical cost per person (1993), ② (1996), ③ (1999), ④ (2002)

*1: per 100,000 population, *2: 100 set for the figure for Tokyo, *3: 100 set for the figure for the whole country, *4: Per household, *5: Per household per month, *6: Per 1,000 households

2. Statistical analysis

A correlation analysis between the number of patients with depression (per 100,000 population), and social, economic and cultural factors (74 items) was conducted. Pearson’s product-moment correlation coefficient was computed for analysis⁷⁾.

III. Results

1. Correlations between the number of patients with depression, the labor force and financial data

Table 1 lists those items with statistically significant correlation coefficients among the number of depressed patients (per 100,000 population), the labor force and finance. These correlations were found for 9 items, including total cash income and earnings per person in the prefecture. The annual earnings of each resident in the prefecture was negatively correlated with total cash income and positively correlated with total work hours (Labor Force Survey, businesses employing 5 or more).

2. Correlations among the number of depressed patients, normal expenditures and time schedules

Table 2 lists those items showing statistically significant coefficients among the number of depressed patients (per 100,000 population), normal expenditures and time schedules. Statistically significant correlations were found for 13 items, including the region-specific consumer price index (comprehensive), family income expenditures for working families (education and educational entertainment) and daily time schedule (sleep, commuting to work and school). The number of depressed patients was positively correlated with family

income and expenditures for working families (social expenses) and daily time schedule (for sleep, rest and relaxation) and negatively correlated with the regional consumer price index and daily time allocation (for commuting and going to school).

3. Correlation between the number of depressed patients and educational status

Table 3 lists those items related to educational status showing statistically significant correlation with the number of depressed patients per 100,000 population. The number of patients was negatively correlated with the percentage of high school graduates (males) advancing further to educational institutions (universities) and positively correlated with the percentage of high school graduates (males) advancing to higher vocational schools or to being employed.

4. Correlation between the number of depressed patients and medical expenses

Table 4 lists those items among the medical expenses that show statistically significant correlations with the number of depressed patients per 100,000 population. Statistically significant positive correlations were found between the number of patients and medical expense per person for 1993, 1996, 1999 and 2002.

Table 1 Correlation between the number of patients with depression and labor force and Financial data

Items	Standard Correlation Coefficient	p value
Labor force		
Total hours of work (establishments employing 5 or more) (Industrial Survey)*1	0.363	0.012
Total cash payment (establishments employing 30 or more) (Industrial Survey)*1	-0.368	0.011
Total cash payment (establishments employing 30 or more)(manufacturing)*1	-0.382	0.009
Total cash payment (establishments employing 5 or more) (Industrial Survey)*1	-0.391	0.007
Total cash payment (establishments employing 5 or more) (manufacturing)*1	-0.411	0.005
Finance		
Income per prefectural resident (1990)*1	-0.405	0.005
Income per prefectural resident (1995)*1	-0.404	0.005
Income per prefectural resident (2000)*1	-0.354	0.015
Income per prefectural resident (2003)*1	-0.328	0.025

*1: 100 set for the figure for Tokyo

*2: 100 set for the figure for the whole country

*3: Per household

*4: Per household per month

Table 2 Correlation between the number of patients with depression and costs and personal time allocation data

Items	Standard Correlation Coefficient	p value
costs		
Region-specific consumer price index (comprehensive)*2	-0.340	0.02
Quantities of food purchased per year (butter)*3	-0.375	0.01
Income and expenditures of a working family (education)*4	-0.322	0.028
Income and expenditures of a working family (cultural entertainment)*4	-0.302	0.04
Income and expenditures of a working family (entertainment)*4	0.322	0.028
Personal time allocation		
Personal time allocation within a day (males)(sleep)	0.461	0.002
Personal time allocation within a day (males)(commuting to work or school)	-0.561	< 0.0001
Personal time allocation within a day (males)(rest and relaxation)	0.405	0.005
Personal time allocation within a day (females)(sleep)	0.352	0.016
Personal time allocation within a day (females)(commuting to work or school)	-0.556	< 0.0001
Personal time allocation within a day (females)(housework)	-0.293	0.046
Personal time allocation within a day (females)(rest and relaxation)	0.347	0.017
Personal time allocation within a day (females)(hobby and entertainment)	-0.296	0.044

*1: 100 set for the figure for Tokyo

*2: 100 set for the figure for the whole country

*3: Per household

*4: Per household per month

IV . Discussion

According to the 2004 data in Japan, the prevalence of depression during the preceding 12 months is 2.2% and the lifetime prevalence is 6.5 to 7.5%⁵⁾. Among Americans aged 18 years or older, the corresponding figures are 6.6% and 16.2%, respectively⁸⁾. According to studies in which a self-recording screening test with proven reliability and relevance was conducted on aged individuals residing in communities,

around 10%, or some as high as 18.2%, were deemed to suffer from depression⁹⁾. As proven by these figures, a large number of patients suffer from depression in Japan, the United States and other countries. Thus it is important to promote the policies to prevent this condition.

For that purpose, approaches have been made from diverse viewpoints. Recently, studies on the effects of social, economic and cultural factors have been attracting attention. In the present study, the relationship between the number of

Table 3 Correlation between the number of patients with depression and Education data

Items	Standard Correlation Coefficient	p value
Education		
Percentage of high school graduates selecting various options (males)(universities)	-0.299	0.042
Percentage of high school graduates selecting various options (males)(vocational schools)	0.327	0.025
Percentage of high school graduates selecting various options (males)(employment)	0.380	0.009

Table 4 Correlation between the number of patients with depression and medical care data

Items	Standard Correlation Coefficient	p value
Medical care		
National Health Care Expenditure: medical cost per person (1993)	0.450	0.002
National Health Care Expenditure: medical cost per person (1996)	0.461	0.002
National Health Care Expenditure: medical cost per person (1999)	0.462	0.002
National Health Care Expenditure: medical cost per person (2002)	0.386	0.008

depressed patients and a number of socio-economic-cultural factors was investigated by using statistical data for this country. From the correlations with the labor situation and economic factors, it was noted that there are fewer depressed patients in those areas where individual incomes and total cash wages are high and total working hours are short. Thus it was presumed that the economic situation is positively related to the number of depressed patients. Next, the correlation with daily monetary consumption indicated that fewer depressed patients are found in those areas where area-related price differences are large and the people spend more for education and cultural entertainment. The correlation with daily time schedules showed that fewer people are affected by depression in those areas where people spend more time commuting to work or school and less time for rest and sleep. For educational status, fewer people suffered from depression where more people went to universities. A tendency was noted for the local incidence of depression to increase proportionally with a rise in medical expenses.

The results presented above can be summarized as follows: fewer depressed patients are found in those areas where a good economic situation prevails; a greater amount of money is expended for education and cultural endeavors; and the educational level is high.

Many studies have cited socioeconomic factors — such as low income, low educational achievement, economic deprivation and poor social support — as risk factors for depression^{10,11}. Kondo et al.¹⁾ indicated that the income level within a municipality is inversely related to the percentage of depressed patients within the population. They also reported that when equivalent income is used (i.e., consideration given to family size by dividing family income by the square root of the number of people within the family), depression will occur more frequently at any age level at lower income levels. It was reported that according to a 1993 National Health Survey in England, the mental health level determined by GHQ was lower in unemployed men and women¹²⁾. Furthermore, it was reported in the area of psychiatry that the incidences of depressive symptoms,

alcohol dependence, suicide, and trauma increase when the socioeconomic conditions deteriorate. A study on the increased incidence of suicide (not necessarily synonymous with depression) and macro-socioeconomic factors reported that the increase in suicide rate among men is related to an increase in unemployment and a fall in GDP. Marmot et al.¹³⁾, and Mattiasson et al.¹⁴⁾, gave the following explanation for these findings: the lower the socio-economic class, the more likely the people find themselves exposed to the risk of being unemployed and economically depressed, chronically raising the mental and psychological stress level; subsequently, they develop common mental conditions such as anxiety and eventually depression.

These earlier studies indicated that when social and economic conditions are generally depressed, the incidence of depression increases. The correlation analysis of the present study on the number of depressed patients and the labor and economic conditions led to a similar finding. One may conclude that in Japan a socioeconomic slowdown following an economic bubble collapse played a role in the recent increase in the number of patients with depression.

Next, the relationship between everyday life style and depression is examined. A Swedish study statistically proved that those people who frequently participated in cultural activities in their leisure time, even when their initial health status or educational status was taken into consideration, lived significantly longer than those who rarely participated in these activities¹⁵⁾. With reductions in leisure time, people lose their social contacts and their individualism becomes exaggerated: it is reported that such a state leads to a marked increase in the development of depression. Lane¹⁶⁾ also observed that reductions in personal time and the development of consumer-driven culture resulted in marked increases in the incidence of depression. He concluded that weakening of social bonding is the direct cause for this trend. In other words, when a person becomes too immersed in his work or is too pre-occupied with shopping, TV viewing or other activities related to personal spending, he gradually loses time or interest in social participation and eventually slips into depression. The results

of the present study did not show any clear cut trend between the depressed patients and personal spending or their time allotted to daily activities as clearly as stated above; but if one considers the effects of confounding elements, it is readily conceivable that there is some correlation.

For the relationship between the educational level and depression, there is a study by Kondo et al. who observed 1,196 Japanese women between the ages of 29 and 39 to find the relationship between their educational level and mental health. After adjusting for their income as well as the husbands', an analysis was conducted to measure the probability of the existence of psychiatric problems such as depression. When the likelihood was set at 1.0 for university graduates, for junior high school graduates it was significantly higher (11.4 times). The current study produced similar results: in those areas where the incidence of depression was high, fewer people attended university and many high school graduates sought employment without further education.

The number of patients with depression in each prefecture and their socio-economic-cultural factors were comprehensively examined. The results suggested that depression is related to one's economic state, life style and educational level. It became evident that to prevent depression, it is necessary to expand the bio-medical models that have focused only on phenomena related to aspects of the natural science of the disease and to understand health and illness through bio-psycho-social models.

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