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Traditional Chinese medicine usage among schizophrenia patients

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KEYWORDS
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Summary
Objective: This study uses a nationwide population-based dataset to explore factors and patterns associated with traditional Chinese medicine (TCM) usage among schizophrenia patients.
Design: A retrospective population-based study. Administrative claims data obtained from the Taiwan National Health Insurance Research Database covering the periods 1996–2004 was used to examine patients hospitalized with schizophrenia between 1996 and 2001 ($n = 34{,}100$) to determine whether they had visited TCM practitioners in 2004 for treatment of schizophrenia.
Setting: Taiwan.
Main outcome measures: Independent variables included patient's age, gender, comorbid medical disorders, number of visits to clinics, number of hospitalizations, income and the geographical location and urbanization level of patients' residences. Multivariate logistic regressions were performed to determine the association between these factors and visits to TCM practitioners for the treatment of schizophrenia.
Results: 3144 of the patients (9.2%) had visited TCM practitioners during 2004. After adjusting for other factors, the odds of such visits by males were found to be 0.825 times those for females, with the odds decreasing with patient's age and urbanization level. The odds of visits to TCM practitioners for patients hospitalized more than once were 3.557 times as high as those for other patients, while those for patients with $\geq$50 prior visits to other conventional clinics were 54.9 times those with $\leq$10 prior clinic visits.
Conclusions: We conclude that patient's gender, age, geographical location, urbanization level, severity of illness, number of visits to clinic, income and the presence of diabetes and hypertension all have significant associations with TCM usage.

Introduction

A substantial increase has been noted in the use of complementary and alternative medicine (CAM) in Western countries, with various studies having reported that more than one-third of all Americans had, at some time during the

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past decade, used CAM for a variety of health problems.[1–4] It is even reported in some studies that the use of CAM appears to be higher among people with psychological disorders than among the general population as a whole.[5]

A national survey carried out in 1997 by Kessler et al. reported that 56.7% of adults who had complained of anxiety attacks had used CAM to treat their condition during the previous year, as did 53.6% who had complained of severe depression.[2] Wu et al.[6] also reported that 54% of women suffering from depression had reported some use of CAM during the previous year. Indeed, several studies have concluded that psychological disorders were one of the primary factors leading to CAM usage.[7,8]

Nevertheless, despite the profusion of studies undertaking investigations into the use of CAM as a treatment protocol for patients with psychological disorders, to the best of our knowledge, there have been very few studies addressing the patterns of CAM usage among patients with specific mental disorders. Russinova et al.[9] reported that of the 40 adult schizophrenia patients examined in their study, 15% had used herbs at some time for their mental problems; it is, however, clear that no unequivocal conclusions could be drawn from such a small and unrepresentative sample. Furthermore, as in the majority of the prior studies, the Russinova et al.[9] study used survey research work to ascertain CAM usage, as opposed to examining the use of CAM among psychiatric patients in the 'real world'.

Despite the obvious diversity in the varieties of CAM, there has been a general tendency in the prior studies to include several different CAM varieties into a single category. Furthermore, the patterns and factors associated with the use of remedies derived from a person's native or ancestral culture may also differ from practices in other cultures; indeed, within Chinese communities, the use of traditional Chinese medicine (TCM) has prevailed for more than 2000 years as the 'conventional' method of treating mental disorders.[10] Today, TCM remains the most popular form of CAM usage in Taiwan among people suffering from mental disorders.[11]

Based on prior studies, it is reasonable to assume that schizophrenia patients in Taiwan may use TCM at a higher rate. However, it is probable that the patterns and factors associated with TCM usage among schizophrenia patients in Asian countries will differ from findings of prior studies in Western ones. Because TCM usage may interact with concomitant psychiatric treatment, either positively or adversely, mental health professionals need more information on this issue. This study therefore, sets out to explore the patterns and factors associated with TCM usage among schizophrenia patients in Taiwan, using a nationwide population-based dataset.

Initiated in March 1995, Taiwan's National Health Insurance (NHI) program finances health care for all citizens of Taiwan. Characteristics of Taiwan's NHI include; universal coverage, a single-payer payment system with the government as the sole insurer, comprehensive benefits, access to any medical institution including conventional medicine or TCM according to the patient's choice, very low out-of-pocket expenses (visiting allopathic and TCM clinics costs patients the same amount), and a wide variety of providers well distributed throughout the country. Allopathic and TCM practitioners compete with one another for patients.

By comparing our results with the findings of various studies undertaken in Western countries, we may be able to provide some hint as to the future trends in TCM usage among schizophrenia patients in Chinese communities. This study could also have some important policy implications for mental healthcare professionals and policymakers; by facilitating cross-country comparisons, a better understanding may emerge of the help-seeking behavior of schizophrenia patients and the factors influencing their decision to adopt the use of CAM.

Method

Database

This study uses administrative claims data from the National Health Insurance Research Database (NHIRD), published by the National Health Research Institute in Taiwan, covering the years 1996—2005. The dataset includes all medical claims data from the National Health Insurance (NHI) program, covering in excess of 21 million people, and thereby representing around 96% of the island's population.

The NHI system is characterized by a single-payer payment system with all patients having unrestricted access to any healthcare provider of their choice. Various modalities of TCM provided by board-certificated practitioners, including Chinese herbal remedies, acupuncture and manipulative therapy, have already been covered by the NHI program and are readily available. Thus, the NHRID offers a unique opportunity to explore actual TCM usage among schizophrenia patients in the real world.

Study sample

All patients admitted to hospital psychiatric departments in Taiwan between January 1996 and December 2001 with a principal diagnosis of schizophrenia (ICD-9-CM codes 295.XX) were selected as our study sample from the dataset ($n = 34{,}137$). Those patients under 18 years of age ($n = 37$) were excluded in order to limit the study sample to the adult population of Taiwan. Ultimately, we were left with a sample of 34,100 eligible schizophrenia patients.

Key variables of interest

The dependent variable in this study was whether or not the patients had visited TCM practitioners in 2004 for the treatment of schizophrenia. Since the NHIRD includes all medical claims data on ambulatory care visits, this allows us to identify whether the patients had ever visited TCM practitioners during that particular year.

The key independent variables of interest included; the age and gender of the patient, comorbid medical disorders (specifically, hypertension and diabetes, which have been observed to have higher rates among schizophrenia patients[12]), the level of urbanization and geographical location (Northern, Central, Eastern and Southern Taiwan) of the patient's community of residence, the number of visits to clinics in 2004, the number of hospitalizations in 2003 and

2004 and the monthly income. The patients were divided into one of four age groups, 18—24, 25—34, 35—49 and ≥50 years.

In accordance with the standards published by the Taiwanese National Health Research Institute, urbanization levels in Taiwan comprise of seven strata, with level 1 referring to the 'most urbanized' communities and level 7 referring to the 'least urbanized' communities. These standards include the population density of the community (people/km^2), the proportion (in percentage terms) of people educated to college level or above, the proportion (in percentage terms) of elderly people within the community (those over the age of 65 years), the proportion of agricultural workers per 100,000 of the population and the number of physicians per 100,000 of the population. In this study, however, we take the level of urbanization of the community in which the patients resided as comprising of only five strata. This is essentially because there were very small numbers of schizophrenia cases in levels 5—7; thus, these three levels were combined into one single group, which we now refer to as level 5.

Since the data on the severity of the patients' illnesses was unavailable from the NHIRD, we used the number of hospitalizations for the treatment of schizophrenia in 2003—2004 as a proxy for the severity of the disease. This variable comprised of three alternatives, 0, 1 or ≥2. Finally, the monthly income was split into three levels: 0, NT$1-9999 and ≥NT$10,000.

Statistical analysis

The SAS statistical package (SAS System for Windows, Version 9.1) was used to perform the statistical analysis of the data in this study, with descriptive statistical analyses, including the frequency, percentage, mean and standard deviation, being performed on all of the identified variables. Pearson's χ^2-tests were also carried out to determine the significance of the crude associations between the independent variables and TCM usage. Multivariate logistic regressions were then performed with TCM usage as the dependent variable (yes = 1, no = 0), and the independent variables comprising of the age and gender of the patients, comorbid medical disorders, the level of urbanization and geographical location (Northern, Central, Eastern and Southern Taiwan) of the community in which the patients resided, the number of hospitalizations in 2003—2004 and the monthly income. A two-sided p-value of ≤0.05 was considered to be statistically significant.

Results

Of the total sample of 34,100 schizophrenia patients, 3144 (9.2%) had visited TCM practitioners for the treatment of schizophrenia during 2004; details on the demographic distribution of the sampled patients are provided in Table 1, which shows that the mean age of the sampled patients was 41.0 (±7.4) years.

Of the total number of patients, 15,162 (44.5%) had not been hospitalized between 2003 and 2004, while 2580 patients (7.6%) had complications of diabetes and 3142 (9.2) had complications of hypertension. Surprisingly, 11.6% of the sampled patients had visited conventional clinics on more than 50 occasions in 2004.

Table 1 Descriptive analysis of sampled schizophrenia patients in Taiwan, 2004[a]

Variables	Total no.	%
Gender		
Male	19,255	56.5
Female	14,845	43.5
Age		
18—24	1,790	5.3
25—34	9,107	26.7
35—49	16,003	46.9
≥50	7,200	21.1
Geographical location		
Northern	15,093	44.3
Central	7,324	21.5
Southern	10,052	29.5
Eastern	1,631	4.8
Urbanization level		
1 (highest)	8,272	24.3
2	9,399	27.6
3	5,391	15.8
4	4,921	14.4
5 (lowest)	6,117	17.9
Number of hospitalizations in 2003—2004		
0 or 1	19,230	56.4
≥2	14,870	43.6
Number of visits to clinics in 2004		
≤10	12,212	35.8
11—24	11,231	32.9
25—49	6,691	19.6
≥50	3,966	11.6
Monthly income		
0	6,537	19.2
NT$1-9,999	16,796	49.3
≥NT$10,000	10,767	31.6
Diabetes		
Yes	2,580	7.6
No	31,520	92.4
Hypertension		
Yes	3,142	9.2
No	30,958	90.8

[a] Total sample number = 34,100.

The demographic distribution of the sampled patients, by TCM usage, is presented in Table 2, where the Pearson's χ^2-tests reveal that visits to TCM practitioners had significant correlations with patient gender ($p = 0.021$), age ($p < 0.001$), geographical location ($p < 0.001$), urbanization level ($p < 0.001$), the number of hospitalizations in 2003—2004 ($p < 0.001$), the number of visits to clinics in 2004 ($p < 0.001$), the monthly income ($p < 0.001$) and whether a patient's condition was complicated by diabetes ($p < 0.001$) or hypertension ($p < 0.001$). Table 2 also presents the unadjusted odds ratio estimates of the likelihood of patients visiting TCM practitioners.

Table 2 Distribution of the characteristics of sampled schizophrenia patients in Taiwan, by traditional Chinese medicine usage, 2004[a]

Variables	Traditional Chinese Medicine Usage				OR	95% CI	*p*-Value
	Yes		No				
	Total no.	%	Total no.	%			
Total	3144	9.2	30,956	90.8			
Number of TCM visits, mean (S.D.)	6.8 (± 9.6)						
Gender*							
Male	1715	8.9	17,540	91.1	0.918	0.853—0.988	0.021
Female	1429	9.6	13,416	90.4	1.000		
Age***							
18—24	229	12.8	1,561	87.2	1.000	—	—
25—34	1059	11.6	8,048	88.4	0.906	0.772—1.063	0.225
35—49	1451	9.1	14,552	90.9	0.679	0.581—0.793	<0.001
≥50	405	5.6	6,795	94.4	0.407	0.341—0.487	<0.001
Geographical location***							
Northern	1342	8.9	13,751	91.1	1.000	—	—
Central	822	11.2	6,502	88.8	1.320	1.201—1.452	<0.001
Southern	895	8.9	9,157	91.1	1.010	0.921—1.108	0.830
Eastern	85	5.2	1,546	94.8	0.534	0.421—0.678	<0.001
Urbanization level***							
1 (highest)	805	9.7	7,467	90.3	1.000	—	—
2	918	9.8	8,481	90.2	1.027	0.926—1.140	0.609
3	520	9.7	4,871	90.4	0.997	0.883—1.126	0.961
4	459	9.3	4,462	90.7	0.986	0.870—1.118	0.831
5 (lowest)	442	7.2	5,675	92.8	0.741	0.654—0.841	<0.001
Number of hospitalizations in 2003—2004***							
0 or 1	558	2.9	18,672	97.1	1.000	—	—
≥2	2586	17.4	12,284	82.6	6.747	6.132—7.422	<0.001
Number of visits to clinics in 2004***							
≤10	109	0.9	12,103	99.1	1.000	—	—
11—24	371	3.3	10,860	96.7	3.793	3.059-4.703	<0.001
25—49	1079	16.1	5,612	83.9	21.347	17.486—26.060	<0.001
≥50	1585	40.0	2,381	60.0	73.910	60.574—90.182	<0.001
Monthly income***							
0	564	8.6	5,973	91.4	1.000	—	—
NT$1—9,999	1476	8.8	15,320	91.2	1.008	0.907—1.120	0.882
≥NT$10,000	1104	10.3	9,663	89.8	1.208	1.082—1.349	<0.001
Diabetes***							
Yes	304	11.8	2,276	88.2	1.401	1.231—1.595	<0.001
No	2840	9.0	28,680	91.0	1.000	—	—
Hypertension***							
Yes	325	11.2	2,790	88.8	1.294	1.145—1.462	<0.001
No	2792	9.0	28,166	91.0	1.000	—	—

*Indicates $p < 0.05$;*** indicates $p < 0.001$.
[a] Total sample number = 34,100.

Table 3 provides the adjusted odds ratio estimates of the likelihood of patients visiting TCM practitioners for schizophrenia treatment. After adjusting for other factors, the odds of male patients visiting TCM practitioners for such treatment were 0.825 times (95% CI = 0.756—0.900, $p < 0.001$) those for females, with the odds ratios of visits to TCM practitioners decreasing with the patient's age.

Interestingly, the odds ratios of visits to TCM practitioners also decreased with urbanization level. As compared to patients living in the highest urbanization level (level 1), the respective odds ratios of visits to TCM practitioners for patients living in levels 4 and 5 (the lowest levels) were 0.798 and 0.671. Table 3 also indicates that for patients with ≥2 hospitalizations, the odds of visiting TCM practitioners were

Table 3 Adjusted multiple logistics regression analysis of relationships between traditional Chinese medicine usage and schizophrenia patient characteristics[a]

Variables	Traditional Chinese medicine usage		
	OR	95% CI	*p*-Value
Gender			
Male	0.825	0.756—0.900	<0.001
Female (reference group)	1.000	—	—
Age			
18—24 (reference group)	1.000	—	—
25—34	0.802	0.667—0.964	0.019
35—49	0.626	0.522—0.752	<0.001
≥50	0.321	0.261—0.394	<0.001
Geographical location			
Northern (reference group)	1.000	—	—
Central	1.383	1.232—1.552	<0.001
Southern	0.930	0.838—1.033	0.176
Eastern	0.579	0.448—0.747	<0.001
Urbanization level			
1 (highest) (reference group)	1.000	—	—
2	0.923	0.821—1.038	0.181
3	0.962	0.836—1.106	0.584
4	0.798	0.688—0.926	0.003
5 (lowest)	0.671	0.580—0.777	<0.001
Number of hospitalizations in 2003—2004			
0 or 1 (reference group)	1.000	—	—
≥2	3.557	3.209—3.943	<0.001
Number of visits to clinics in 2004			
≤10 (reference group)	1.000	—	—
11—24	3.570	2.876—4.431	<0.001
25—49	15.610	12.751—19.109	<0.001
≥50	54.904	44.772—67.327	<0.001
Monthly income			
0 (reference group)	1.000	—	—
NT$1-9,999	0.990	0.876—1.118	0.867
≥NT$10,000	1.364	1.198—1.554	<0.001
Diabetes			
Yes	1.334	1.163—1.530	<0.001
No (reference group)	1.000	—	—
Hypertension			
Yes	1.505	1.321—1.716	<0.001
No (reference group)	1.000	—	—

[a] Total sample number = 34,100.

3.557 times (95% CI = 3.209—3.943, $p < 0.001$) as high as those for patients who had been hospitalized on only one occasion, or not at all.

Rather surprisingly, the odds of visiting TCM practitioners for patients with ≥50 visits to clinics in 2004 were 54.904 times those for patients who had undertaken ≤10 visits to clinic in 2004. As expected, the number of visits to TCM practitioners increased with the monthly income; those patients with monthly income in excess of NT$10,000 were 1.364 times (95% CI = 1.198—1.554, $p < 0.001$) more likely to visit TCM clinics than those with no income. Interestingly, the adjusted odds of visiting TCM practitioners for patients whose condition was complicated by diabetes or hypertension were 1.401 (95% CI = 1.231—1.595, $p < 0.001$) and 1.294 (95% CI = 1.145—1.462, $p < 0.001$) times, respectively, compared to those who did not have diabetes or hypertension.

Discussion

This nationwide population-based study reveals that, at some time in 2004, 9.2% of the sampled schizophrenia patients had visited TCM practitioners in Taiwan. The mean frequency of visits to TCM clinics among this population was

6.8 (±9.6), with about 20% of the patients having visited TCM practitioners in excess of 10 times in that particular year. However, all of the TCM users continued to utilize conventional psychiatric services. Thus, as previously suggested,[5] TMC usage in Taiwan may be better regarded as an add-on (complementary) to conventional psychiatric care rather than a substitute (alternative). It nevertheless remains difficult to provide a precise answer to the question of why people with mental disorders tend to turn towards TCM.

'Dissatisfaction', the first of three hypotheses proposed to explain CAM usage,[7] is based upon the rationale that patients may be dissatisfied with conventional treatment because of its inhumanity, ineffectiveness, adverse effects or high costs; and indeed, higher rates of dissatisfaction with conventional services have been reported among CAM users with mental disorders.[5] In our study, schizophrenia patients who used TCM still received psychiatric treatments. As suggested by Eisenberg et al.[13] it seems that TCM usage among schizophrenia patients does not necessarily reflect dissatisfaction with allopathic care.

The second hypothesis relates to 'philosophical congruence', which suggests that CAM provides more attractive therapies since they are regarded as being more compatible with the users' values, beliefs and perspective of the world. Astin[7] concluded that those using CAM appeared to do so largely because they found CAM to be more congruent with their own values, beliefs and philosophical orientation towards health and life. The third hypothesis is the need for personal control[14]; people favor CAM because they see it as offering more personal autonomy and control over their healthcare decisions.

Also based on the NHIRD, Chen and colleagues reported that the use of TCM and acupuncture for mental disorders is far less than for other medical conditions.[10,15] Since diagnoses in the NHIRD are according to the ICD-9-CM, which is often quite different from disease entities in TCM, actual TCM usage for mental conditions is very likely underestimated due to differences in coding.

Our study finds that females are more likely to visit TCM practitioners, which is consistent with the findings of the majority of the prior studies.[16,17] Indeed, while the first of the national surveys by Eisenberg et al.[4] was unable to determine any significant gender difference in CAM usage, their follow-up survey nevertheless showed that CAM usage was more common among women. Kessler et al.[2] nevertheless, demonstrated that the gender difference disappeared when further analysis was performed among respondents suffering from anxiety and depression. Thus, it remains an open question as to whether gender differences exist in CAM usage.

The results of this study indicate that younger schizophrenia patients have a greater tendency to visit TCM practitioners. This comes in light of the Druss and Rosenheck[8] study, which found that CAM usage was particularly prevalent among younger individuals reporting mental conditions. In the two studies by Eisenberg et al.[4,18] CAM usage was also found to be significantly more common among people aged 25—49 years (and 35—49 years). It has been suggested that the impact of age on CAM usage can be explained by cohort effects[18]; if that is true, given the gradual increase in younger cohorts of schizophrenia patients, TCM usage is likely to become increasingly popular.

We find that visits to TCM practitioners have significant correlations with both the monthly income and geographical location. This is consistent with the majority of the prior studies on the factors associated with CAM usage, each of which concluded that higher income and residing in the Western areas of the US were associated with CAM usage.[4,5,8]

Surprisingly, we also find that the odds of visits to TCM practitioners for patients with ≥50 visits to conventional medicine clinics were as high as 54.9 times those for patients with ≤10 clinic visits. This is in line with the conclusions of a study which found that, as compared to non-users, CAM users in Taiwan were associated with more frequent visits to conventional clinics.[11] This pattern of service utilization may indicate different help-seeking behavior among schizophrenia patients who are also TCM users.

Interestingly, we also find that that the odds of visits to TCM practitioners for patients with ≥2 hospitalizations were about 3.6 times those for patients who, in the previous 2 years, had been hospitalized on only one occasion, or not at all. In other words, patients with more active psychopathology had a greater propensity for visiting TCM practitioners. This is consistent with the findings of Burstein et al.[19] which concluded that CAM usage was associated with greater physical symptoms, as well as the greater intensity of the symptoms, for women who had been recently diagnosed with early stage breast cancer. It is quite feasible that patients with more active psychopathology have higher levels of emotional disturbance, and are thus, in turn, more highly motivated to seek additional methods of treatment.[11]

This study also finds that the adjusted odds ratios of patients visiting TCM practitioners decreased with the level of urbanization. To the best of our knowledge, no prior study has ever explored the relationship between CAM usage and the level of urbanization of the community in which the patients reside, although one study in Taiwan, undertaken by Wu et al.[20] did find that almost half of rural families and two-thirds of urban families had, at some time, used CAM.

One possible reason for the lower incidences of visits to TCM practitioners in rural areas may simply be the barriers to accessibility, given the low density of TCM practitioners in such areas; indeed, there is a significant geographical imbalance in the distribution of TCM clinics in Taiwan, since they are more likely to be concentrated in metropolitan and suburban areas than rural areas. Therefore, those residing in the lower urbanization levels simply have fewer opportunities to visit TCM clinics.

This study suffers from two potential limitations. Firstly, the NHIRD lacks critical data on socio-demographic characteristics, such as marital status, educational level and health status, all of which, as noted in several of the prior studies, may influence CAM usage.[1,2,21] Secondly, although the proportion of contracted TCM clinics had reached about 93.4% in 2007 (2709 out of the total of 2900 TCM clinics), the remaining clinics had still not contracted with the NHI Bureau; thus, the utilization data on these TCM clinics is not included in the NHIRD. Faced with the challenge of the urgent demand for effective methods of treatment, mental healthcare professionals need to understand the pattern of TCM usage among schizophrenia patients in light of the increasing popularity of TCM usage throughout the population as a whole. Within the context of the above limitations, the results do

demonstrate some factors associated with TCM usage among schizophrenia patients.

Since a substantial proportion of schizophrenia patients are demonstrating the simultaneous use of TCM and conventional treatment, further clinical studies are required to explore both the risks involved in, and the potential effectiveness of, a combination of TCM and conventional psychotropic agents. It should be noted that a potentially dangerous interaction was found in some of the prior studies between pharmacotherapies used in psychiatric patients and certain forms of CAM.[22] It is, therefore, vitally important to determine the clinical impacts of TCM in schizophrenia treatment, based upon empirical evidence, before mental healthcare professionals and policymakers can adopt a principled policy stance on the use of TCM by schizophrenia patients.

Our study confirms that the age and gender of patients, geographical location, level of urbanization, severity of illness, the number of visits to clinic, the income-related insured amount and the presence of diabetes or hypertension all have significant correlations with visits to TCM practitioners. It is hoped that further exploration of the help-seeking behavior of the schizophrenia population may provide appropriate approaches that could ultimately prove to be of significant benefit to the management of this devastating mental disorder.

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