Original Article

How does Clinical Setting Affect Acupuncture Practice in Taiwan: a comparison between Chinese Medicine Physicians Practicing in General Hospitals and in Chinese Medicine hospitals and Clinics

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Objectives: To understand how clinical environment affects acupuncture practice in general hospitals, Chinese medicine (CM) clinics and hospitals. **Design and Outcome Measures:** A self-reported questionnaire comprising questions of demographic data, general use of acupuncture and other CM therapeutic methods, and diagnosis/ treatment of low back pain, was adopted in this cross-sectional survey and sent to 867 CM physicians. **Results:** 403 questionnaires were sent to general hospitals and Chinese medicine hospitals and 464 to the Chinese medicine clinics. In the first group 177 questionnaires were returned (we excluded 15 incomplete questionnaires), and the response rate was 40.2%. In the second group, 206 questionnaires were returned (we excluded 19 incomplete questionnaires), and the response rate was 40.3%. The respondent physicians practicing in general hospitals were more often female, younger and had less clinical experience but were more involved in teaching and publishing articles. A majority of them graduated from a School of Chinese Medicine (45%); or the School of Post-baccalaureate Chinese Medicine (50%). The proportion of doctors certified by the Special License Qualification Examination was higher (39%) in clinics than in hospitals (5%). Significant differences appeared between general hospitals versus CM clinics and hospitals regarding the frequency of use of therapeutic methods, the

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categories of disease treated by acupuncture, the chosen diagnostic techniques, as well as the needle retention time, and the frequency of treatment per patient. There were no substantial differences with regards to needle techniques and the choice of acupuncture points. **Conclusion:** This study suggests that the clinical setting can considerably influence the use of acupuncture such as the categories of disease treated, the retention time of the needles, and frequency of treatment. Factors such as gender, training, and the number of years of clinical experience of the physician also played a part.

Key words: acupuncture, practice, clinical setting, questionnaire survey, Taiwan

Introduction

Acupuncture, as part of Chinese medicine (CM), is not a uniform field of knowledge and practice; on the contrary, it is known for its plurality. Historians of CM [1-3], medical anthropologists [4-8], and physicians conducting clinical trials [9-22], all underline the plurality of diagnosis and practice in this field. Acupuncture is widely practiced [23] as an integral part of the health care system in Taiwan. Acupuncture is normally adopted alongside other traditional therapeutic techniques: e.g., prescription of CM herbs and traumatology manipulation techniques. Very few CM physicians rely solely on acupuncture. In 2016, Taiwan recorded 6431 licensed active CM physicians, most of them practicing in CM clinics, 11.8% in general hospitals and about 0.3% in CM hospitals [24].

Although there is some literature addressing CM in Taiwan [23, 25-27], very few articles have discussed the various uses of acupuncture [28, 29]. In particular, little is known about how physicians use acupuncture. In other countries, many articles outline diverse acupuncture practices, especially for treating low back pain (LBP) [9-20]. These studies focus on differential diagnosis and a variety of treatment modalities: e.g., choice of acupuncture points and number, stimulation and retention time of needles, co-treatment, average number of visits. Most such studies cite variable and common threads in acupuncture practices: e.g., the physician's identity and training seemed to contribute to the variety of styles of diagnosis and treatment [10, 12, 13, 30]. Yet none of these studies mention the potential effect of clinical settings on this plurality of practice.

This study attempts to understand how acupuncture is practiced by Taiwanese CM physicians and to compare practices in general hospitals with those in traditional CM hospitals and clinics. The role of the medical environment and its influence on acupuncture practice is also discussed.

Materials & Methods

1. Study Design and Survey Questionnaire

This descriptive study used a cross-sectional self-reported questionnaire survey that aimed to outline demographics and characteristics of CM

physicians as well as the patterns and scope of their acupuncture practices. The questionnaire was conceptualized and drafted in three parts by our research team: (1) personal information on CM physicians, clinical setting of practice, and participation in the medical community; (2) general use of acupuncture; (3) diagnosis and treatment of LBP as an example to understand the diagnosis and treatment patterns used by physicians. It was pre-tested on 10 graduate students and 4 professors of the China Medical University Graduate Institute of Acupuncture Science, and later on 28 CM physicians during two meetings organized by the CM Physicians Association in Tainan and Taichung. Finally, 5 clinically experienced physicians and professors of CM from the China Medical University were invited to give their advice with regards to the content and design of the questionnaires; we amended accordingly. Test-retest reliability of the 68 questions was evaluated by inviting 14 physicians, half of which were working in general hospitals and half in clinics, to fill the questionnaire at biweekly intervals. Intraclass correlation coefficient (ICC) of 40 questions was 0.40-0.75 (fair to good reproducibility), another 19 above 0.75 (very good reproducibility)[31]. Only nine were under 0.4.

The finalized questionnaire took 20 minutes to complete, items in each part as follows.

Part 1) Characteristics of the CM physicians: age, gender, years of clinical experience, education background, teaching experience, publications, participation in medical associations, medical environment of practice, and location of professional practice.

Part 2) General Use of Acupuncture: main disease categories treated by acupuncture and its use alongside other therapeutic methods of CM. A five-point scale was adopted to evaluate the frequency of general use. Each gradation corresponded to approximately 25 patients, e.g. "0: never used (0 patient), 1: rarely (1-25 patients), 2: occasionally (25-50 patients), 3: frequently (50-75 patients), 4: very frequently (75-100 patients)". A list of 64 diseases indicated for acupuncture discussed at the 1996 WHO conference in Milan was also included in Part 2. The physicians were asked to mark the top 10 diseases on which acupuncture has the most profound effects, based on their clinical experience.

Part 3) Diagnosis and treatment of LBP: tools used to diagnose LBP, acupuncture points and categories of points used to treat LBP, insertion, stimulation and retention time of needles; frequency of treatment per week. Importance of diagnostic methods and treatment of LBP was defined with a three-point scale: "not important" (= 0), "important" (= 1), and "very important" (= 2). For acupuncture points, doctors were asked to write down the three points they used most frequently to treat acute LBP and chronic LBP.

2. Sampling of CM physicians

Physicians were sampled from: (1) 72 general hospitals (including teaching hopitals, metropolitan hospitals and local community hospitals) with a CM unit or acupuncture department and 1 CM hospital (totally 403 physicians); and (2) clinics listed by Taiwan's

Chinese Medical Association of Acupuncture (464 physicians). CM physicians in the general hospitals and CM hospital were selected through internet search, in order to identify physicians using acupuncture. CM physicians in the clinics were identified through the list of the Chinese Medical Association of Acupuncture. Addresses of CM clinics were all registered and can be searched in the Department of Health Internet database. These self-reported questionnaires were sent to both groups and were returned within two weeks.

3. Statistical Analysis

For continuous variables, data are expressed as mean ± SD; for categorical variables as numbers with corresponding percentages. Returned questionnaires were compared using the Chi-square test for categorical variables and the Student's t-test for continuous variables. The outcomes were dichotomized before assessing differences according to gender, years of clinical experience (less than 10 years of practice or more than 10 years of practice), training, and were compared with a Chi-square test. Finally, adjusted odds ratios were estimated and reported with their confidence interval. For the retention time of the needles and the frequency of treatment we used a linear regression analysis, adjusted for age, gender, years of clinical experience, training, and environment of practice. Statistics were calculated with the statistical software STATA. All comparisons were two-tailed, with $P < 0.05$ regarded as statistically significant.

Results

1. Response Rate of Questionnaires

Of 403 questionnaires sent to physicians working in general and CM hospitals, 177 were returned, 15 of those blank: i.e., response rate of 40.2%. Of 464 questionnaires sent to CM clinics, 206 were returned, with 19 blank; the response rate was 40.3%. While keying answers, a total of 11 questionnaires were excluded due to missing data, which left us with a sample consisting of 338 CM physicians, 143 working in general hospitals, 15 in CM hospitals, and 180 in CM clinics. Since management and organization of CM hospitals resemble those of clinics, we categorized both groups together in the following analysis (Flowchart in Figure 1).

2. CM Physician Characteristics

Demographics of physicians in general hospitals were quite different from those in CM hospitals/clinics. Physicians in general hospitals were younger (40.2 years versus 47.5 years) and had less clinical experience (8.2 years of practice versus 14.3 years). Also, the percentage of women working in general hospitals was higher than in CM hospitals/clinics. Training backgrounds were strikingly different between groups. Although in both groups nearly half the respondents graduated from the China Medical University School of Post-baccalaureate CM (PbSCM), the proportion of physicians graduated from a School of CM (SCM, from the China Medical University or the Chang Gung University) and PbSCM was much higher in general hospitals than in clinics; the proportion
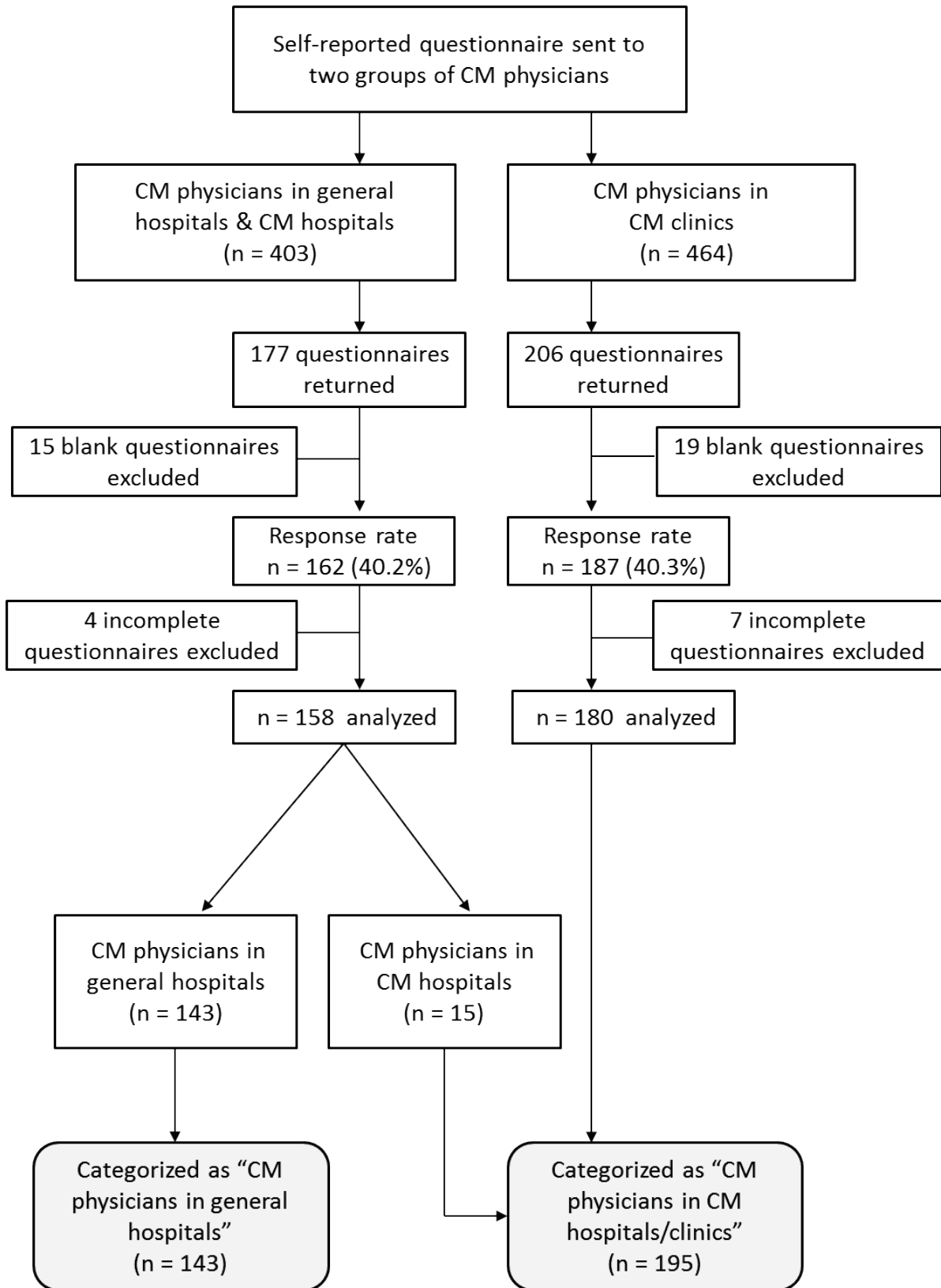
Figure 1   Flowchart depicting categorization of Chinese Medicine physicians analyzed.

of physicians certified via the Special License Qualification Examination (SLQE) was hence much higher in clinics than in general hospitals. Physicians working in hospitals had more teaching and research experience, and published more articles. Among the physicians interviewed, the proportion working in either hospitals or clinics was roughly similar in various parts of the country, with only a few located on the eastern coast (Table 1).

Table 1. Comparison of Characteristics: Chinese Medicine Physicians in General Hospitals and in Chinese Medicine Hospitals/Clinics

Characteristics	General Hospitals (n = 143)	CM Hospitals/Clinics (n = 195)	*p*-value
Age (y/o)	40.2 ± 8.5	47.5 ± 9.0	**< 0.01**
Years of practice	8.2 ± 6.9	14.3 ± 8.4	**< 0.01**
Gender			**0.01**
Male	92 (65.2%)	152 (77.9%)	
Female	49 (34.8%)	43 (22.1%)	
Education/Certification background			**< 0.01**
School of CM, CMU or CGU	64 (44.8%)	24 (12.5%)	
School of Post-baccalaureate CM, CMU	72 (50.3%)	93 (48.4%)	
Special License Qualification Examination	7 (4.9%)	75 (39.1%)	
Teaching experience	86 (60.1%)	77 (39.7%)	**< 0.01**
Had publications	86 (60.1%)	43 (22.3%)	**< 0.01**
Location of practice			0.15
Northern Taiwan	54 (37.8%)	53 (27.2%)	
Central Taiwan	40 (28.0%)	71 (36.4%)	
Southern Taiwan	46 (32.2%)	65 (33.3%)	
Eastern Taiwan	3 (2.1%)	6 (3.1%)	

‧ Continuous data presented as Mean ± SD.
‧ Categorical data presented as number of patients (percentages).
‧ Values calculated using Student's t and Chi-square test.
‧ p < 0.01 and p < 0.05 statistically significant and marked in boldface.
‧ CM: Chinese Medicine; CMU: China Medical University; CGU: Chang Gung University.

3. CM Therapeutic Methods and Tools

In both settings, the three most often "very frequently" used therapeutics were the processed Chinese herbal medicine (referred hereafter as processed CM), acupuncture and lifestyle advice (Table 2). While the use of acupuncture was almost the same between groups, other CM therapeutics varied significantly. In general hospitals, the use of infrared heat lamp, scalp acupuncture and lifestyle advice was significantly higher than in clinics. On the other hand, tape plasters, traumatology techniques, cupping, and *guasha* were more common in clinics (Table 2).

Next, using a dichotomized score ("never", "rarely" or "occasionally" versus "frequently" or "very frequently"), it has been shown that the use of therapeutics such as lifestyle advice, bloodletting and traumatology techniques as well as infrared heat lamp, tape plasters, and raw herbs varied also with gender, experience and training of the physicians.

Lifestyle advice differed according to training, gender and experience. SLQE physicians were less prone to dispense lifestyle advice (27% versus 66% for SCM and 58% for PbSCM physicians), and female CM physicians (67%) dispensed more advice than their male colleagues (48%). Less experienced physicians (60%) dispensed more advice than more experienced physicians (44%).

Traumatology techniques were more often dispensed by male than by female physicians (26% of the female CM physicians tended to use these techniques "frequently" or "very frequently" compared to 46% of male CM

physicians).

Tape plasters were more frequently used by male CM physicians (62%) than female physicians (46%). Less experienced physicians (53%) used less frequently the tape plasters than their more experienced colleagues (65%). And SCM trained physicians (43%) used tape plasters also less often than their colleagues (61% for PbSCM and 68% for SLQE physicians).

Infrared heat lamp was used more by physicians with less experience (72% versus 54% for physicians with more experience) and also less frequently by SLQE physicians (49% compared to 66% for SCM and 70% for PbSCM physicians).

Bloodletting technique was the less frequently used therapeutic. It stands out clearly that SLQE physicians used these techniques more often than the other CM physicians. (24% of SLQE physicians used bloodletting "frequently" or "very frequently" versus only 6% for the SCM course and 7% for the PbSCM course). The years of experience were also correlated to the use of this technique. CM physicians with more experience (16%) used this technique more frequently compared to their colleagues with less experience (6%).

Finally, controlling for clinical experience, gender and training, the clinical setting was still a significant factor for the previously mentioned methods: traumatology, tape plasters, cupping, infrared heat lamp, *guasha*, life style advice and scalp acupuncture. Adjusted odds ratios (OR) with confidence intervals are given in Table 2.

How Clinical Setting Affects Acupuncture Practice

Table 2. Chinese Medicine Therapeutic Methods and Tools used by Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

Therapeutic methods and tools	Scale	Never	Rarely	Occasionally	Frequently	Very Frequently		p value[a]	OR	95% CI	p value[b]
	Number of patients	0	1 to 25	26 to 50	51 to 75	76 to 100					
Processed CM (GMP)	GH	0	3 (2%)	4 (3%)	26 (18%)	109 (77%)	75.1%	0.53	0.93	(0.26 - 3.36)	0.92
	CMHC	1 (1%)	1 (1%)	5 (3%)	42 (22%)	138 (73%)					
Acupuncture	GH	2 (1%)	13 (9%)	9 (7%)	26 (19%)	90 (64%)	61.5%	0.28	0.77	(0.37 - 1.58)	0.47
	CMHC	0	15 (8%)	16 (8%)	48 (25%)	116 (59%)					
Lifestyle advice	GH	1 (1%)	2 (1%)	9 (7%)	31 (22%)	96 (69%)	53.4%	< 0.01	0.47	(0.27 - 0.83)	< 0.01
	CMHC	2 (1%)	5 (3%)	17 (10%)	78 (45%)	70 (41%)					
Infrared heat lamp	GH	2 (1%)	12 (8%)	18 (13%)	56 (40%)	53 (38%)	29.7%	< 0.01	0.36	(0.19 - 0.65)	< 0.01
	CMHC	18 (10%)	30 (16%)	39 (21%)	55 (29%)	44 (24%)					
Tape plasters	GH	2 (1%)	33 (24%)	46 (33%)	33 (24%)	26 (18%)	27%	< 0.01	2.53	(1.47 - 4.37)	< 0.01
	CMHC	5 (3%)	24 (13%)	27 (14%)	68 (37%)	62 (33%)					
Traumatology	GH	17 (12%)	41 (29%)	47 (33%)	19 (13%)	18 (13%)	17.9%	< 0.01	2.76	(1.58 - 4.85)	< 0.01
	CMHC	13 (7%)	27 (15%)	51 (27%)	55 (29%)	41 (22%)					
Scalp acupuncture	GH	5 (4%)	16 (11%)	33 (24%)	50 (36%)	35 (25%)	15.6%	< 0.01	0.41	(0.23 - 0.70)	< 0.01
	CMHC	18 (10%)	39 (22%)	57 (31%)	53 (29%)	15 (8%)					

Therapeutic methods and tools	Scale	Never	Rarely	Occasionally	Frequently	Very Frequently		p value[a]	OR	95% CI	p value[b]
	Number of patients	0	1 to 25	26 to 50	51 to 75	76 to 100					
Moxibustion	GH	1 (1%)	36 (25%)	46 (33%)	35 (25%)	23 (16%)	13.2%	0.24	0.66	(0.38 - 1.14)	0.14
	CMHC	7 (4%)	54 (29%)	62 (33%)	42 (23%)	20 (11%)					
Raw herbs	GH	2 (1%)	40 (28%)	52 (37%)	33 (23%)	15 (11%)	10.4%	0.33	1.45	(0.83 - 2.52)	0.19
	CMHC	7 (4%)	41 (22%)	61 (33%)	56 (31%)	19 (10%)					
Cupping	GH	8 (5%)	50 (36%)	50 (36%)	28 (20%)	4 (3%)	9.4%	**< 0.01**	2.07	(1.16 - 3.69)	**< 0.05**
	CMHC	14 (7%)	46 (25%)	54 (29%)	47 (25%)	27 (14%)					
Ear acupuncture	GH	3 (2%)	41 (29%)	54 (39%)	33 (24%)	8 (6%)	7.4%	0.74	0.93	(0.52 - 1.67)	0.82
	CMHC	4 (2%)	54 (29%)	77 (41%)	36 (19%)	16 (9%)					
Guasha	GH	31 (23%)	64 (47%)	32 (23%)	7 (5%)	3 (2%)	4.7%	**< 0.01**	4.38	(1.84 - 10.42)	**< 0.01**
	CMHC	34 (18%)	60 (33%)	52 (28%)	26 (14%)	12 (7%)					
Bloodletting	GH	20 (14%)	74 (53%)	39 (28%)	7 (5%)	0	0.9%	**< 0.05**	1.55	(0.56 - 4.23)	0.39
	CMHC	18 (9%)	82 (44%)	59 (32%)	24 (13%)	3 (2%)					

- GH= General hospitals (n=143); CMHC= Chinese Medicine Hospitals/Clinics (n= 195).
- Categorical data presented as number of patients (percentages).
- Values calculated using Chi-square test and Logistic Regression analysis adjusted for gender, training, years of clinical experience and clinical setting.
- a: analyzed by Chi-square test.
- b: by Logistic Regression analysis.
- $p < 0.01$ and $p < 0.05$ statistically significant and marked in boldface.

4. Categories of Disease Treated by Acupuncture

Diseases of the musculoskeletal system and nervous/vascular system were among those reported to be treated "very frequently" by the highest number of physicians. Diseases of the ear, nose and throat, rheumatoid and immune system conditions, digestive system conditions as well as pregnancy and obstetrics conditions were treated more "occasionally". Statistically significant differences arose between physicians working in the two clinical settings regarding two categories of disease: diseases of the nervous and vascular system and neoplasms. Both categories were more frequently treated by acupuncture in general hospitals (Table 3).

The use of acupuncture also varied with the physicians' characteristics.

Firstly, gender was associated with the use of acupuncture for treating gynecology and obstetrics as well as rheumatoid and immune system diseases. Female CM physicians were more prone to use acupuncture "frequently" or "very frequently" for treating gynecology and obstetrics related conditions (41% of the female physicians compared to 24% of male CM physicians). On the contrary, male CM physicians treated rheumatoid and immune system diseases more frequently (40%) than their female colleagues (20%).

Secondly, training was also associated with the scope of the disease treated. The SLQE physicians tended to use acupuncture "frequently" or "very frequently" for a broader range of diseases than the CM physicians

graduated from the universities. This was a general tendency and it was statistically significant with regards to the digestive (54% of the SLQE physicians compared to 39% for the SCM and 37% for the PbSCM physicians), the rheumatoid and immune (45% of the SLQE physicians compared to 37% for the SCM and 28% for the PbSCM physicians), the cardiovascular (32% of the SLQE physicians compared to 14% for the SCM and 17% for the PbSCM physicians), the respiratory (32% of the SLQE physicians compared to 12% for the SCM and 17% for the PbSCM physicians), and the skin diseases (27% of the SLQE physicians compared to 16% for the SCM and 8% for the PbSCM physicians).

Finally, the years of clinical experience were correlated with the use of acupuncture as a treatment for the rheumatoid and immune system as well as the skin diseases. Physicians with more experience tended to use acupuncture more often for rheumatoid and immune system (45% versus 27% for the less experienced physicians), they also treated skin disease more frequently (20% versus 9% compared with physicians that had less experience).

Controlling for gender, experience and training, the difference between clinical settings was still significant for the diseases of the nervous and vascular system and neoplasms (Table 3).

The top 10 diseases chosen from the list of 64 diseases recommended by the WHO were: LBP (76.9%), sciatica (66.1%), headache (61.2%), sprain and strain (59.4%), scapula-

Table 3. Categories of Diseases Treated by Acupuncture by Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

	Scale	Never	Rarely	Occasionally	Frequently	Very Frequently		p value[a]	OR	95% CI	p value[b]
	Number of patients	0	1 to 25	26 to 50	51 to 75	76 to 100					
Musculoskeletal system	GH	0	2 (1%)	6 (4%)	35 (25%)	99 (70%)	66.1%	0.65	0.83	(0.28 - 2.46)	0.74
	CMHC	0	3 (2%)	8 (4%)	60 (31%)	123 (63%)					
Nervous and vascular system	GH	0	4 (3%)	7 (5%)	52 (36%)	80 (56%)	37.9%	**< 0.01**	0.11	(0.05 - 0.25)	**< 0.01**
	CMHC	0	17 (9%)	63 (33%)	64 (34%)	46 (24%)					
Ear, throat and nose	GH	5 (3%)	29 (21%)	48 (33%)	43 (30%)	18 (13%)	10.6%	0.49	0.87	(0.52 - 1.48)	0.62
	CMHC	4 (2%)	30 (16%)	73 (39%)	64 (34%)	17 (9%)					
Rheumatoid and immune system	GH	8 (6%)	27 (19%)	62 (44%)	28 (20%)	15 (11%)	10.2%	0.22	0.85	(0.47 - 1.51)	0.57
	CMHC	12 (7%)	44 (24%)	59 (32%)	50 (27%)	18 (10%)					
Digestive system	GH	5 (3%)	22 (16%)	60 (42%)	42 (30%)	13 (9%)	8.1%	0.57	1.01	(0.59 - 1.72)	0.97
	CMHC	3 (2%)	29 (15%)	77 (40%)	70 (36%)	14 (7%)					
Gynecology and obstetrics	GH	9 (7%)	32 (23%)	64 (45%)	30 (21%)	6 (4%)	5.8%	0.29	1.26	(0.68 - 2.32)	0.46
	CMHC	12 (7%)	53 (28%)	64 (34%)	46 (24%)	13 (7%)					
Endocrine and metabolic system	GH	17 (12%)	45 (32%)	43 (31%)	29 (21%)	6 (4%)	4.9%	0.47	1.37	(0.75 - 2.49)	0.31
	CMHC	13 (7%)	57 (30%)	61 (32%)	48 (26%)	10 (5%)					

How Clinical Setting Affects Acupuncture Practice

	Scale / Number of patients	Never 0	Rarely 1 to 25	Occasionally 26 to 50	Frequently 51 to 75	Very Frequently 76 to 100		p value[a]	OR	95% CI	p value[b]
Genitourinary system	GH	14 (10%)	42 (30%)	55 (39%)	24 (17%)	5 (4%)	3.7%	0.94	0.60	(0.30 - 1.19)	0.14
	CMHC	21 (11%)	61 (33%)	68 (37%)	27 (15%)	7 (4%)					
Cardiovascular system	GH	18 (13%)	52 (37%)	44 (31%)	19 (13%)	8 (6%)	3.4%	0.08	0.64	(0.32 - 1.28)	0.20
	CMHC	18 (10%)	56 (30%)	74 (40%)	34 (18%)	3 (2%)					
Mental and behavioral diseases	GH	15 (11%)	53 (37%)	40 (28%)	28 (20%)	6 (4%)	3.3%	0.53	0.84	(0.45 - 1.55)	0.57
	CMHC	24 (13%)	57 (30%)	65 (35%)	36 (19%)	5 (3%)					
Respiratory system	GH	18 (13%)	55 (39%)	47 (33%)	15 (11%)	5 (4%)	3.1%	0.08	1.06	(0.53 - 2.13)	0.88
	CMHC	16 (9%)	53 (29%)	72 (40%)	35 (19%)	5 (3%)					
Neoplasms	GH	22 (16%)	57 (41%)	40 (28%)	15 (11%)	5 (4%)	2.2%	**< 0.01**	0.20	(0.06 - 0.52)	**< 0.01**
	CMHC	60 (33%)	79 (43%)	37 (20%)	5 (3%)	2 (1%)					
Diseases of skin	GH	24 (17%)	56 (40%)	48 (34%)	10 (7%)	3 (2%)	2.2%	0.20	1.96	(0.83 - 4.63)	0.13
	CMHC	25 (14%)	68 (37%)	58 (31%)	29 (16%)	4 (2%)					
Diseases of blood	GH	46 (33%)	68 (48%)	21 (15%)	4 (3%)	1 (1%)	0.7%	0.28	0.63	(0.15 - 2.61)	0.53
	CMHC	65 (36%)	67 (37%)	40 (22%)	7 (4%)	1 (1%)					

• GH= General hospitals (n=143); CMHC= Chinese Medicine Hospitals/Clinics (n= 195).
• Categorical data presented as number of patients (percentages).
• Values calculated using Chi-square test and Logistic Regression analysis adjusted for gender, training, years of clinical experience and clinical setting.
• a: analyzed by Chi-square test.
• b: by Logistic Regression analysis.
• $p < 0.01$ and $p < 0.05$ statistically significant and marked in boldface.

humeral periarthritis (57.9%), chronic pain of the locomotor system (55.7%), myofascitis (53.9%), menorrhalgia (48.6%), facial paralysis (43.7%) and backache (40.6%). There were no differences between groups.

5. Diagnostic Methods for Assessing LBP

The methods considered by most of physicians (>50%, in both groups) as "very important" to assess LBP were the location of pain, quality and intensity of pain, factors which decrease or increase pain, the history of pain and palpation of the pain's location. In general, all diagnostic items received a higher scoring by physicians working in general hospitals, especially diagnostic tools used in Western medicine: e.g., X-ray, MRI, physical and neurological examination. Specific CM diagnostic methods, such as observation of complexion, vitality, pulse and tongue diagnosis were obviously considered less important by both groups (Table 4). Statistically significant differences arose between physicians working in the two clinical settings regarding the importance given to the following diagnostic tools: the factors which decrease or increase pain, the physical examination, the use of X-ray and MRI diagnosis tools.

Next, using a dichotomized score ("not important" or "important" versus "very important"), other factors such as training and gender were also related to the importance given to some of the diagnosis tools.

The training of the physician was statistically significant with regards to the importance given to the physical and neurological examin-

ation, the factors which decrease or increase pain, the history of pain and the medical history of the patient. The SLQE physicians considered all these diagnostic tools as less important than their colleagues trained in the universities (16% of the SLQE physicians found it "very important" to use physical examination, compared to 39% for the SCM and 35% for the PbSCM physicians; 17% of the SLQE physicians found it "very important" to use neurological examination compared to 36% for the SCM and 32% for the PbSCM physicians; 53% of the SLQE physicians found the factors which decrease or increase pain to be "very important" compared to 72% for the SCM and 59% for the PbSCM physicians; 47% of the SLQE physicians found the history of pain "very important", compared to 66% for the SCM and 61% for the PbSCM physicians; and 28% of the SLQE physicians found the medical history of the patient to be "very important" compared to 50% for the SCM and 44% for the PbSCM physicians).

Gender was also related to the use of laboratory data. Female physicians were more likely to consider this diagnostic tool as "very important" (20% compared to 10% of the CM male physicians).

Controlling for gender, experience and training, the difference between clinical settings was still significant for the importance given to the use of X-Ray and MRI as well as for the physical examination and the factors which decrease or increase pain.

6. Characteristics of LBP Treatment

Physicians were asked to mention three

Table 4. Importance given to the Diagnostic Methods and Tools used to diagnose Low Back Pain by Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

Diagnostic Methods/Tools	Considered as "very important"			
	All	General Hospitals (n = 143)	CM Hospitals/Clinics (n = 195)	*p*-value
Location of pain	67.7%	103 (72%)	125 (64.4%)	0.14
Quality and intensity of pain	64.8%	98 (68.6%)	121 (62%)	0.22
Factors which decrease or increase pain	61.1%	97 (67.8%)	107 (56%)	**< 0.05**
History of pain	59.2%	93 (65.5%)	106 (54.6%)	0.05
Palpation of pain area	56.7%	88 (62.4%)	99 (52.4%)	0.07
Medical history of patient	42.4%	66 (46.2%)	77 (39.7%)	0.24
Posture	32.9%	53 (37.1%)	57 (29.7%)	0.16
Physical examination	32.8%	57 (40.4%)	45 (26.5%)	**< 0.01**
Neurological examination	31.3%	51 (37%)	42 (26.4%)	0.05
X-Ray	28.8%	53 (37.3%)	42 (22.3%)	**< 0.01**
Pulse diagnosis	28.1%	42 (29.8%)	49 (26.8%)	0.55
MRI/CT	19.7%	36 (26.5%)	23 (14%)	**< 0.01**
Vitality	16.5%	23 (16.2%)	32 (16.8%)	0.89
Complexion	16.4%	25 (17.8%)	29 (15.4%)	0.58
Tongue diagnosis	14.9%	21 (15%)	27 (14.8%)	0.95
Laboratory data	14.7%	25 (18%)	21 (12.1%)	0.15

・ Calculated from scale "not important/important" versus "very important."

・ Values calculated using Chi-square test.

・ *p* < 0.01 and *p* < 0.05 statistically significant and marked in boldface.

points they usually chose for the treatment of acute/chronic LBP. For both cases, the five most frequently used points were BL40 (59.9%), BL23 (52.6%), GB34 (24.5%), BL25 (23.4%), and *Ashi* points (13.3%). For acute LBP, SI3 (15.5%) and *Yaotuidian* (11.8%) were also frequently used. For chronic LBP, use of KI3 (7.5%) and *Yaoyan* (7.2%) was also reported.

Regarding categories of points, the *Ashi* points were considered to be the most important, followed by the five transport points. Except for the *Ashi* points, there were no significant differences between the importance given to other acupuncture point categories, with regards to the clinical setting (Table 5). However, the influence of the training of the physicians was statistically significant with regards to the importance given to the use of *Ashi* points and

Table 5. Characteristics of Acupuncture Treatment for Low Back Pain. Comparison between Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

	Considered as very important		
	General Hospitals (n = 143)	CM Hospitals/Clinics (n = 195)	*p*-value
Categories of chosen points			
Ashi points	53 (39.5%)	50 (27.3%)	**< 0.05**
Transport points	39 (30.2%)	44 (24.9%)	0.30
Confluence of vessel points	28 (24.1%)	39 (26.2%)	0.71
Source points	29 (23.3%)	33 (20.3%)	0.54
Extra points	27 (23.1%)	24 (15.1%)	0.10
Cleft points	27 (24.1%)	34 (22.3%)	0.74
Stimulation with needles			
Obtaining *Qi* (*De Qi*)	74 (54%)	102 (52.3%)	0.76
Hand stimulation	40 (30.8%)	37 (22.3%)	0.10
Electro-stimulation	24 (18.2%)	25 (14.7%)	0.42
Supplementation and draining methods			
Lifting-thrusting	36 (28.6%)	43 (24.3%)	0.40
Twirling	35 (29.4%)	44 (25.7%)	0.49
Open-closed	20 (19.2%)	11 (7.8%)	**< 0.01**
Directional	19 (18.9%)	23 (16.1%)	0.58
Respiratory	10 (9.6%)	23 (14.7%)	0.22
Quick-slow	14 (13.5%)	12 (8.6%)	0.22

・Calculated from scale "not important/important" versus "very important."
・Values calculated using Chi-square test.
・*p* < 0.01 and *p* < 0.05 statistically significant and marked in boldface.

Extra points (17% of the SLQE physicians considered the *Ashi* points category as "very important" compared to 41% for SCM and 35% for the PbSCM physicians; and 6% of the SLQE physicians considered the Extra points category as "very important" compared to 21% for SCM physicians and 22% for the PbSCM physicians). The years of clinical practice appeared to be positively associated with the importance given to the Cleft points (31% of experienced physicians considered the Cleft points as "very important" compared to 16% of their less experienced colleagues). When controlling for gender, training and clinical experience, the clinical setting association was not anymore significant concerning the *Ashi* points.

Regarding needle technique, obtaining *Qi* was considered to be very important for treatment. Stimulation by hand was considered more important than electro-stimulation. The main supplementation and draining methods were the twirling and the lifting-thrusting methods. The only significant differences between the two clinical settings appeared in the use of the open-closed supplementation and draining method (Table 5). This difference was still significant after controlling for gender, training and years of clinical experience. In addition, the training of the physician was significantly associated to the importance given to the use of electro-acupuncture (5% of the SLQE physicians considered the use of electro-acupuncture to be "very important" compared to 19% for SCM physicians and 18% for the PbSCM physicians).

Needle retention time for chronic LBP appeared to be longer than for acute LBP. Regarding the practicing environment, needle retention time was significantly shorter in the clinics for acute LBP (Table 6). The number of weekly treatments was higher for acute LBP; the frequency of visits was significantly higher in

Table 6. Needle Retention Time for Low Back Pain Treatment. Comparison between Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

Type of low back pain	Mean (Min)	Mean (Min)	General hospitals vs. CM hospitals/clinics Adjusted mean difference (95% CI)			
			Mean (Min)	B	95% CI	*p*-value
	General Hospitals (n = 143)	CM Hospitals/Clinics (n = 195)	Total (n = 338)			
Acute low back pain	20.43	18.55	19.49	1.88	0.26 to 3.51	**< 0.05**
Chronic low back pain	21.45	20.37	20.91	1.08	-0.61 to 2.77	0.21

· Mean: Needle retention time calculated and expressed in minutes.

· Linear regression analysis adjusted for age, years of practice, gender, training and clinical setting.

· *p* < 0.05 statistically significant and marked in boldface.

Table 7. Treatment Frequency for Low Back Pain. Comparison between Chinese Medicine Physicians in General Hospitals and Chinese Medicine Hospitals/Clinics

Type of low back pain	Mean	Mean	General hospitals vs. CM hospitals/clinics Adjusted mean difference (95% CI)			
			Mean	B	95% CI	*p*-value
	General Hospitals (n = 143)	CM Hospitals/Clinics (n = 195)	Total (n = 338)			
Acute low back pain	4.32	4.83	4.58	-0.51	-0.79 to -0.23	**< 0.01**
Chronic low back pain	3.97	4.33	4.15	-0.36	-0.62 to -0.10	**< 0.01**

‧ Mean calculated from number of treatments per week: "**1** = once/week; **2** = 1 to 2 times/week; **3** = 2 times/week; **4** = 2 to 3 times/week; **5** = 3 times/week; **6** = more than 3 times/week."

‧ Linear regression analysis adjusted for age, years of practice, gender, training and clinical setting.

‧ *p* < 0.01 statistically significant and marked in boldface.

clinics, for both chronic and acute LBP (Table 7).

Discussion

In Taiwan, acupuncture is practiced both in general hospitals and clinics. Several general hospitals have a CM unit or an acupuncture department that offers consultations. CM physicians in the general hospitals are working in an environment where the management imposes a number of rules (participation to morning meetings, encouragement to do research and publications, among others), however all the infrastructure (i.e. desk, computer, beds) and the therapeutic tools (i.e. needle, infrared heat lamp) are provided by the hospital. CM physicians working in clinics (or in CM hospitals which are a little bit bigger than the clinics) can have their own clinic or they are hired and work with other physicians. They are overall freer in the organization of their clinical practice but they are responsible for the financial considerations of running a clinic (i.e. productivity, furniture). Therefore, having physicians working in general hospitals or in CM clinics allows comparison between those two types of clinical setting and enables a discussion on its influence on acupuncture practice. Previous studies have stated that acupuncture practice may vary among practitioners and elicited some common trends [9, 10, 13-15, 18] but none discussed how the environment affects practice.

Demographics of CM physicians differed strikingly between those working in general hospitals versus clinics, reflecting actual conditions in Taiwan. Young physicians freshly graduated from university will more likely choose to work in hospitals, where they are trained to do research, publish papers and given opportunities to teach more easily. Older

physicians with more clinical experience usually open their own private practice. Interestingly, in Taiwan a dual CM licensure was used until 2010. SLQE physicians did not need to take university courses but studied CM with a master or by other means and passed a national examination [25]. SLQE physicians are therefore less connected with institutional settings and often work in clinics, as our survey indicated.

In Taiwan, the most commonly used CM therapy is the prescription of processed CM followed by traumatology technique and acupuncture [23, 28]. CM physicians seldom use acupuncture alone to treat the patient and usually combine various therapeutic methods. Therefore, we also investigated the other therapeutic methods that are used alongside acupuncture treatment. This study found the prescription of processed CM prevalent among CM physicians practicing acupuncture. In both groups, the use of processed CM and acupuncture methods was nearly the same. However, we observed a great variation in the utilization of other therapeutic methods whose use was not the same depending on the structure and organization of the clinical setting. In the clinics, the physicians performed complementary techniques more often: e.g., traumatology manipulation, cupping, *guasha*, tape plasters. The use of complementary techniques is often a way to guarantee a better service to the patient and to build a larger customer base and higher income for the clinic. As for the use of infrared heat lamps, it is often a cost consideration that will prevent the CM physicians working in clinics to use them. We

also found than some therapeutic techniques were associated with gender, training and years of clinical experience. For example, SLQE physicians were more prone to use bloodletting techniques. This indicates that those techniques are not valued in institutional settings and are therefore less used by the CM physicians graduated from the universities. Gender can also be a factor, as traumatology manipulations require some strength, female CM physicians used them less frequently. Huang also reported similar factors in their article [32]. But overall, after adjustment for these confounding factors, the choice of the therapeutic techniques was still strongly correlated to the clinical setting.

As reported in similar studies, acupuncture is mainly used for musculoskeletal diseases and neurologic problems [28-30]. Here also, the scope of acupuncture use somewhat differs between general hospitals and CM clinics. In general hospitals, the treatment of neurologic diseases and neoplasm is significantly more frequent. This reflects the fact that patients with serious diseases such as a stroke or cancer will more likely go to hospitals to receive treatments. Chen et al.[28] reported that internal organ problems would be treated in hospitals whereas CM physicians in clinics would more likely treat injury conditions. However, in our study, the frequency of utilization of acupuncture for common pain and other problems was nearly the same both in general hospitals and clinics. In addition, gender, training and clinical experience appeared to be correlated with the category of disease treated by acupuncture. This

was especially obvious regarding the training of the physician. SLQE physicians tended to treat a larger scope of diseases compared to the physicians educated through the institutional course. This could raise the question of the ongoing process of acupuncture standardization which narrows the use of acupuncture to a certain number of disease categories for which efficacy have been proven in RCT trials. As institutions, universities are largely influenced by this standardization process and this could explain why SCM and PbSCM physicians are restricting their acupuncture treatment to specific disease categories. This question was also raised by Chen et al. [28] quoting a Qing dynasty scholar noting that in ancient time acupuncture was used to cure all kinds of internal diseases. This topic should be investigated further in future studies.

Our study also showed a difference with regards to the importance given to the diagnostic methods, which varied between clinical settings. In general hospitals, all diagnostic methods and tools listed in the questionnaires reached a higher score, but the difference was greater for those from Western medicine. Evidently, X-ray and MRI machines are more accessible to physicians in general hospitals. In addition, hospitals seem to require a more standardized and accurate diagnosis; this may explain the higher regard for these methods. Nevertheless, one can note that specific CM diagnosis methods, such as the tongue and pulse diagnosis, were considered to be less important in the treatment of LBP by all physicians. This could be due to the fact that the aetiology for low back pain is quite simple

and can be determined through palpating and by asking questions without the use of pulse and tongue diagnosis. This trend was also seen in three other studies conducted in Korea [33, 34], in China [19] and America [11, 15]. There were also significant differences between the SLQE physicians and their colleagues graduated from university regarding the importance given to some of the diagnosis tools. The fact that less importance was given to the use of Western medicine diagnosis tools such as the physical and neurological examinations by SLQE physicians is probably due to their lack of Western medicine training. This problem is being addressed since 1989, with the introduction of a mandatory Western medicine training course for SLQE physicians.

In the treatment of LBP, the most frequently used acupuncture points were BL40 and BL23; this replicated the findings of other studies [9, 10, 13, 16-18, 20]. *Ashi* points were considered as the most important category of points to treat LBP and were significantly considered as more important in the hospital setting. However, this association was not significant anymore after controlling for gender, training and years of clinical experience. The importance given to various point categories seems to be more linked to the training of the physician and the years of clinical experience rather than on the clinical setting.

Regarding the needle techniques, there were no notable differences between groups, except for the open-closed supplementation and draining method. Our study showed that obtaining *Qi*

was very important. Hand stimulation was applied more frequently than electro-stimulation, especially in general hospitals. The manipulation of needles, such as the supplementation and draining methods, are also an important aspect of acupuncture practice. However, in the actual practice of acupuncture this aspect is often disregarded. The current system of reimbursement by the National Health Insurance puts the CM physicians under important cost-effectiveness pressure. The reimbursement of acupuncture fees is very low and therefore the CM physician cannot afford to spend too much time with needle manipulations. This time-saving concern was also apparent in the needle retention time.

In our study, needle retention time was shorter than that reported in other studies (average 20-28 min) [35]. Retention time was significantly shorter in clinics for acute LBP treatment. Outside the time-saving concern, another possible explanation is that in general hospitals more beds are available, and sufficient space allows physicians to retain needles longer. Average visits per week numbered significantly higher in clinics. This may also reflect the necessity for physicians in clinics to treat patients more often in order to obtain a better income for the clinic.

Limitations

This study has several limitations. Firstly, the self-reported questionnaire relied on memory and subjective opinion, and this may lead to some biased results. When testing for reliability, we found nine items with poor reproducibility. Four of these congregated in categories of diseases treated by acupuncture, the others were scattered throughout themes. Besides, eyes disease, which can also be treated by acupuncture, were omitted from Table 3, since Table 3 was dedicated to listing the main diseases treated by acupuncture.

Secondly, the sample size of physicians working in hospitals and clinics was disproportionate. Approximately ninety percent of CM physicians work in clinics. In addition, as it was not possible to identify how many CM physicians did or did not use acupuncture, we thus used the list of the Chinese Medical Association of Acupuncture to ensure that the physicians that were chosen regularly practiced acupuncture and could answer the questions appropriately. Regarding the hospital setting, it was also not possible take into account the nested structure of the data. Despite a number of potential biases, this study revealed that the characteristics of acupuncture practice in Taiwan could possibly be influenced by the clinical setting.

Conclusions

This study showed that a number of aspects of acupuncture practice varied according to different clinical settings: e.g., the choice of therapeutic methods, the types of diseases treated, the diagnostic techniques chosen, the needle retention time and the frequency of treatment. However, the choice of points and

acupuncture techniques such as supplementation and draining methods appeared to remain similar. The plurality found in acupuncture practice may be attributed to many factors including the identity, the training and the years of clinical experience of the physician. However, this study suggests that the clinical setting could also considerably influence variations in the use of acupuncture.

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Disclosure Statement

All authors declare that no competing financial interests exist.

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原始論文

臨床環境對針灸執業型態的影響：醫學中心與中醫醫院、診所之比較

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目的：瞭解執業環境（醫院，中醫醫院與中醫診所）對於針刺使用的影響。**材料與方法：**採用自填式問卷進行橫斷面調查，內容包括醫師個人資料、針刺及其他療法使用範圍，及下背痛的診斷方式與針刺治療；共發送867名中醫師。**結果：**本研究發出 403 份問卷給醫院與中醫醫院執業針灸之中醫師，回收 177 份，回覆率 40.2%；發出 464 份問卷給中醫診所執業針灸之中醫師，回收 206 份，回覆率40.3%。在醫院職業者女性比例較高，年紀較輕，臨床經驗較少，但更多地參與教學和投稿文章。大部分醫師畢業於中國醫藥大學中醫學系（45%）或學士後中醫學系（50%）。中醫特考中醫師在診所執業（39%）的比醫院多（5%）。醫院與診所在使用治療方法的頻率，針刺治療的疾病類別，診斷技術、工具及留針時間和治療頻率出現顯著差異；針刺技術和針灸穴位的選擇無明顯差異。**結論：**臨床環境可以較明顯的影響針刺的使用，如治療疾病類別、留針時間和治療頻率；中醫師性別、教育與訓練以及臨床經驗年數等因素也有影響。

關鍵字：針灸、職業環境、問卷調查、台灣

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