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ORIGINAL RESEARCH

Perceptions, Attitudes, Beliefs, and Practices Toward Traditional Chinese Medicine Therapies for Herpes Zoster: A Cross-Sectional Study of Healthcare Professionals

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Introduction: Traditional Chinese medicine (TCM) holds great potential in promoting healing and relieving pain for herpes zoster (HZ) treatments. Evidence showed that both healthcare professionals' (HCPs) belief and knowledge influence their attitudes, which result in their expression and direct behavior. However, little is known in this area regarding TCM treatments for HZ. This study aimed to understand the HCPs' perceptions, attitudes, beliefs, and practices toward TCM and its services for HZ.

Methods: During July 2021 and October 2022, a cross-sectional study of HCPs querying demographics, perceptions, attitudes, beliefs, and practices toward TCM and TCM services for HZ was conducted. The frequency and percentage or mean and standard deviation were used to present categorical data and continuous data, respectively. A Chi-square analysis compared nurses' and doctors' views on TCM treatments for HZ.

Results: Out of 306 eligible respondents, 66.0% used TCM content in clinical practice less than 40% of the time. Respondents reported that there were three main advantages of TCM for HZ, including better crusting and healing, fewer side effects, and mitigating complications. A total of 41.3% (81/196) of the respondents who had cared for/treated HZ patients applied TCM treatments. The three factors most associated with referrals/providing TCM to patients were postherpetic neuralgia, early erythema or papules, and acute pain. Compared to nurses, doctors showed more endorsement of the efficacy and cost-effectiveness of TCM treatments for HZ patients.

Conclusion: The study found that most healthcare professionals in HZ had a favorable view of TCM, but lacked practical experience administering it to patients. Programs should be developed to provide evidence-based TCM treatments and encourage combining TCM with Western medicine for better patient care.

Keywords: Herpes Zoster, Traditional Chinese Medicine, Perception, Attitude, Healthcare Professionals

Introduction

Herpes zoster (HZ), a painful bandlike rash commonly known as shingle, is also caused by the reactivation of the varicella-zoster virus.[1] The overall HZ incidence has been increasing over the past decades ranging from 4.5 to 9.9 per 1000 population person-years globally.[2–4] Approximately 2.8 million HZ cases occur in China annually, estimated to cost $1.3 billion in-hospital medical expenses.[5] Patients with HZ often experience prodromal symptoms including unusual skin sensations, pain, and fever, which are easily misdiagnosed,[6] subsequently resulting in delaying proper treatment and causing unnecessary medical expenditures. In most cases, the HZ rash heals and the pain ceases within about one month of the rash onset.[6] Nevertheless, a multitude of severe and frequently recurring complications and clinical sequelae

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associated with HZ can arise, including postherpetic neuralgia (PHN), central nervous system infections, nerve palsies, and vision loss, among others.[7] The most common complication of HZ, which occurs in 20%-50% of cases, is PHN, which lasts 30 or more days.[8] Among PHN patients, most reported deep burning or aching pain, dysesthesia, or electric shock–like pains, which caused a significant decline in the quality of life and working ability, and about 60% of PHN patients had ever contemplated suicide.[9] In addition, individuals with diabetes are more susceptible to developing HZ, and thus preventing its progression may improve their quality of life.[10] While vaccination has been proven to decrease the disease burden caused by HZ, its high cost, insufficient supply issues, age restrictions, and overall lack of awareness all limit its uptake rate.[11] It is estimated that almost one in three HZ patients suffer from persistent dermatomal neuropathic pain of moderate or severe severity,[12] how to manage their pain level continuously, and effectively has been a major concern for public health worldwide.

According to contemporary medical knowledge, Western medicine (WM) remains the predominant therapeutic approach for HZ and PHN treatments, which is well-known to include early antiviral treatment (eg oral acyclovir) as well as careful pain management (eg oral opioids) according to the WHO's three-step pain hierarchy.[13] Despite the utilization of combination therapies, such as opioids and gabapentin, complete relief of PHN symptoms may not be achieved. Moreover, the modalities of treatment may confer a greater risk of side effects, including addiction to opioid analgesics, kidney failure, fatigue, etc.[14] Approximately 60% of patients with chronic pain reported that complementary and alternative medicine (CAM) had helped them manage their pain.[15] Regarding the CAM treatment for HZ, Gynura divaricate (L.) DC. is widely used as traditional medicine in Africa and Southeast Asia.[16] As one of the most important achievements of Chinese civilization, TCM is based on thousands of years of accumulated knowledge and practice, which still prevails in Chinese. HZ is recorded as "She Chuan Chuang" in ancient China and its treatments can date back to the Ming and Qing Dynasties. The earliest record of Herba Polygoni Perfoliate for external application was in Curative Measures for All Diseases, and the prescription is still included in Chinese Pharmacopoeia.[17] Acupuncture was found to reduce PHN incidence by 83% compared to antiviral therapy.[18] Moreover, bloodletting-cupping combined with WM and acupoint injection combined with WM were examined in a comprehensive comparison of 14 different treatment regimens.[19] These studies all show that TCM holds great potential in promoting healing and relieving pain for HZ treatments.

Generally, in clinical practice, TCM and WM are equally important healthcare systems in China. TCM has the advantages of being patient-centered,[20] having fewer side effects,[21] being cost-effective.[22] As opposed to offsetting the use of WM, TCM provided a complementary role while treating the patients.[23] In China, there were approximately 910 million visits to TCM medical and health service units across the country and 26 million in-patients treated annually.[24] TCM is not only applied in China but also overseas. According to the World Health Organization, acupuncture was the most common form of traditional and complementary medicine practice used by 63% of Member States (113/179).[24] Nevertheless, due to a limited number of infrastructure and practitioners (three in every ten thousand people),[25] there is still a huge potential improvement in the coverage of the current TCM medical care system.

There is a consensus within the healthcare community regarding the importance of "patient-centered care" as a fundamental component of healthcare quality.[26] With nurses and doctors comprising a significant majority of the healthcare workforce, their collaboration is essential in achieving the overarching goal of integrated healthcare delivery.[27] Communication breakdowns among healthcare settings, departments, and team members have been identified as the primary cause of patient harm.[28] Therefore, it is imperative for healthcare professionals, specifically nurses and doctors, to collaborate effectively in addressing the diverse informational requirements of patients from various disciplinary perspectives. If patients are provided with low-quality information, they may process it incorrectly.[29] Recent evidence suggests that TCM combined with WM usually showed a good curative effect.[30] It is estimated that around 60% of Chinese patent herbal medicines are prescribed by WM doctors. However, due to the lack of knowledge of TCM, 40% of these prescriptions are inaccurate.[31] Thus, considering both the theoretical differences between TCM and WM and the restricted Chinese patent herbal medicines prescribing authority of WM doctors, HCPs must cooperate to obtain better results. However, some WM healthcare professionals perceived interprofessional initiatives with TCM HCPs as a threat to their autonomy and were uncomfortable with their patients seeking care from TCM HCPs to a certain extent.[32] Some HCPs perceived TCM as a medical science lacking scientific evidence and TCM HCPs had a lack of knowledge and

skills regarding patient care.[33] Other HCPs positively think TCM has a complementary and alternative role to WM, which is patient-centered and wellness-oriented.[34] HCPs' opinions on TCM and TCM service seem to be divided, which may result in a lower utilization rate of TCM and TCM service.

It is common for patients to feel caught between different clinical opinions and recommendations. Patients may conceal their use of TCM due to the unsupportive or negative attitude of their HCPs, which may lead to increased adverse effects of TCM-drug interactions.[35] There is evidence indicating that improved mutual understanding between TCM and WM HCPs within multidisciplinary settings leads to better patient satisfaction, health literacy, and treatment adherence.[36,37] It appeared that HCPs who had sufficient knowledge of the practice were the ones who recommended or referred patients to appropriate over-the-counter TCM.[38] Individuals' attitudes towards TCM are a significant factor in their choice to use TCM.[39] Furthermore, evidence showed that both HCPs' belief and knowledge influence their attitudes, which result in their expression and direct behavior.[40] However, little is known in this area regarding TCM treatments for HZ. Thus, this study aims to understand the HCPs' perceptions, attitudes, beliefs, and practices toward TCM and TCM services for HZ.

Methods

Study Design

We conducted a cross-sectional survey to assess the HCPs' perceptions, attitudes, beliefs, and practices toward TCM and TCM services for HZ during July 2021 and October 2022. This study was reported following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).[41]

Sampling

HCPs were eligible for this study if they: (1) were aged 18 years or above, (2) worked as a doctor or a nurse (3) could read Chinese and communicate in Mandarin Chinese. We excluded HCPs who worked as health management and support workers, such as hospital administrators, cleaners, and so on.

Sample Size Estimation

This study targeted HCPs working in hospitals, including doctors, and nurses. According to previous literature, 11.9% of HCPs would recommend their patients to use TCM treatments.[42] With a confidence level (CI) of 95% and a significance level of 5%, at least 161 respondents were needed in this study. The sample size was calculated based on the following formula.[43] There were finally 306 respondents included in the analysis after the completion of data collection.

$$N = \frac{Z^2_{\alpha/2} * p(1-p)}{d^2} = \frac{1.96^2 * 0.119(1-0.119)}{0.05^2} = 161$$

Measurements

Medical decision-making is generally influenced by gender, educational levels, and certain occupational roles.[44] Previous evidence showed that education levels and workloads of WM were all significantly correlated with HCPs' medical decisions regarding TCM treatments.[38] Thus, a demographic questionnaire was administered to collect respondents' background information, including gender, position, education, professional title, work experience, level of hospitals, types of departments, and TCM workload.

Respondents were also surveyed on their perceptions, attitudes, beliefs, and practices regarding TCM and TCM service for HZ. The items regarding HCPs' perceptions and practices were designed based on the literature review and group discussion results. Before the formal data collection, 7 experts (3 doctors, 3 nurses, and 1 methodologist) were invited to test the draft via e-mail or telephone call. The questionnaire was minor revised and language-promoted according to experts' feedback. Respondents' attitudes and beliefs toward TCM were assessed by the Traditional Chinese Medicine scale (TCM Attitude Scale) and The Chinese-Western Medical Beliefs (CWMB) scale.

The TCM Attitude Scale consists of 18 items with three dimensions: cognitive (5 items), affective (8 items), and behavioral tendency (5 items). The internal consistency coefficient of each subscale ranged from 0.78 to 0.85.[45] The CWMB scale was used to assess respondents' beliefs about the comparison of the superiority of TCM and WM. The CKMB scale contains 21 items. We deleted the item "TCM can cure diseases and also promote health" due to its factor loading being less than 0.40.[46]

Data Collection

Based on a snowball sampling strategy, HCPs from four hospitals consisting of both TCM departments and general departments were invited and participated in this study. Six trained investigators handed out the questionnaire link to HCPs who met the selection criteria on their contact lists via WeChat, which is the most used social networking software in China. When initial respondents anonymously completed the questionnaire, they were encouraged to circulate the information and the questionnaire link among their contacts who met the selection criteria. With an explanatory note already provided, HCPs were fully informed and explained the study purpose and details by well-trained study investigators. Respondents were fully aware that their participation was voluntary, and that they could withdraw without any consequences. They were also informed that their personal information would be kept strictly confidential. Then the link to an e-questionnaire was provided via WeChat to respondents who agreed to participate. Before they began to respond to the questionnaire, electronic consent needed to be completed first. A reminder would appear before submission if respondents did not finish the compulsory questions.

Data Analysis

SPSS version 25.0 was used to perform all data analyses. Descriptive statistics were used to detail respondents' demographic characteristics and perceptions, attitudes, beliefs, and practices regarding TCM and TCM service for HZ. The frequency, percentage, and median with interquartile range (IQR) were used to present categorical data and continuous data, respectively. We used chi-square analysis to compare the characteristics of perceptions, attitudes, beliefs, and practices regarding TCM treatments for HZ between nurses and doctors.

Results

Between July 2021 and October 2022, we screened a total of 500 HCPs. Of 400 who were eligible, 312 (78.0%) HCPs agreed to participate in this study. After logic checking, six invalid questionnaires were excluded, with a valid recovery rate of 98.1% (306/312).

Table 1 presents the demographic characteristics of HCPs. Most respondents were nurses (52.6%, 161/306) and doctors (47.4%, 145/306) currently working in the clinical department. Most of the respondents reported having the highest education level of diploma or above (98%, 300/306). Approximately half of the respondents had an intermediate professional level (48.4%, 148/306). Most respondents had more than 5 years of work experience (81.7%, 250/306). Besides, respondents mainly worked in tertiary public hospitals (65.0%, 199/306). Over one-third of the respondents worked in the departments that provide TCM services (37.3%, 114/306), but only 27.5% (84/306) of the respondents worked in the department receiving HZ patients. Over 30% of respondents undertook more than 40% TCM content in their clinical practice (33.9%, 104/306).

HCPs' Perception, Attitude, and Belief Regarding TCM and TCM Service for HZ

As shown in Table 2, the top three most preferred TCM treatments by respondents were bone-setting massage therapy (69.6%, 213/306), food therapy (68.3%, 209/306), and acupuncture (54.6%, 167/306). Most of the respondents agreed with recommending TCM services to chronic patients (97.4%, 298/306), while only 37.3% (114/306) of the respondents considered recommending TCM services to acute patients. Most respondents demonstrated that western medicine could be used to treat HZ (87.9%, 268/306). The respondents were most familiar with the use of Chinese herbal medicine for TCM treatment for HZ patients (60.1%, 184/306). More than half of the respondents agreed that TCM was effective in treatments (59.2%, 181/306). More than half of the respondents (61.4%, 188/306) believed that TCM was more effective

Table 1 Demographic Characteristics of the Healthcare Professionals (n=306)

Variables	N(%)
Gender	
Female	223(72.9)
Male	83(27.1)
Position	
Nurse	161(52.6)
Doctor	145(47.4)
Education	
Technical secondary school and below	6(2.0)
Diploma/Bachelor	238(77.7)
Master and above	62(20.3)
Professional level[a]	
Entry or assistance level	116(37.9)
Intermediate level	148(48.4)
Associate level and above	42(13.7)
Work experience	
<5 years	56(18.3)
5–10 years	79(25.8)
>10 years	171(55.9)
Level of hospital[b]	
Tertiary public hospital	199(65.0)
Secondary public hospital	42(13.7)
Primary public hospital	49(16.0)
Private clinics	16(5.2)
Provide TCM services in the departments (yes)	114(37.3)
Work in departments receiving patients with HZ (yes)	84(27.5)
TCM workload	
None	42(13.7)
0%~	127(41.5)
20%~	33(10.8)
40%~	20(6.5)
60%~	39(12.7)
80%~100%	45(14.7)

Notes: a. "Entry or assistance level" referred to resident doctor/nurse aide or licensed practical nurse or senior nurse; "Intermediate" referred to attending doctor / nurse-in-charge; "Associate level and above" referred to associate chief doctor and chief doctor/ associate chief nurse and chief nurse.b. The grading can be analogous to Hospital Compare Star Ratings (HCSR) in America. "Tertiary public hospital" referred to "5-star hospital" / "4-star hospital"; "Secondary public hospital" referred to "3-star hospital"/ "2-star hospital"; "Primary public hospital" referred to "1-star hospital". In China, private clinics are not rated.

in treating HZ crusting and healing, mitigating complications (59.8%, 183/306), and providing better pain relief (58.2%, 178/306).

Over three-quarters of the respondents, they were agreed that the TCM was safe for HZ treatments (76.8%, 235/306). Over four in five respondents were willing to use TCM to treat HZ (84.3%, 258/306). A similar situation occurred on the issue regarding recommending patients to treat HZ with TCM (82.0%, 251/306). The median (interquartile range) score of the TCM Attitude Scale among all respondents was 69.5 (63.0,75.3). In the TCM Attitude Scale, the emotional subscale had the highest score, which ranged from 8 to 40. The median (interquartile range) score of the CWMB Scale among all respondents was 74.0 (68.0,81.0). Respondents obtained higher scores in the TCM superior subscale from the CWMB Scale, with a score range of 11–55.

Table 2 Perception, Attitude, and Belief of the Healthcare Professionals Regarding TCM and TCM Service for HZ (n=306)

Items	N (%) / Median(IQR)
Preference treatments for TCM	
Bone-setting massage therapy	213(69.6)
Food therapy	209(68.3)
Acupuncture	167(54.6)
Oral Chinese herbal medicine	156(51.0)
Point application therapy	139(45.4)
External Chinese herbal medicine	129(42.2)
Cupping therapy	111(36.3)
Movement therapies (Qi Gong or Tai Chi)	48(15.7)
Fire needle therapy	44(14.4)
Recommend TCM services to chronic patients (yes)	298(97.4)
Recommend TCM services to acute patients (yes)	114(37.3)
Knowledge about HZ treatments	
Western medicine	269(87.9)
Chinese herbal medicine	184(60.1)
Acupuncture	142(46.4)
Blood-letting puncture and cupping	100(32.7)
Fire needle therapy	99(32.4)
Lamp moxibustion	60(19.6)
Cotton moxibustion	36(11.8)
Effectiveness of TCM treatments	
Effective	181(59.2)
Slow to work	45(14.7)
Do not know	80(26.2)
Advantages of TCM treatments to HZ patients	
Better for HZ crusting and healing	188(61.4)
Mitigating the complication	183(59.8)
Better pain relief	178(58.2)
Shortening the duration of disease	152(49.7)
Promoting ulcer healing	131(42.8)
Anti-infection	103(33.7)
Recognition for the safety of TCM (yes)	235(76.8)
Personal willingness to use TCM to treat HZ (yes)	258(84.3)
Recommendation for patients to treat HZ with TCM (yes)	251(82.0)
TCM Attitude Scale (range:18–90)	69.5(63.0,75.3)
Subscale: cognition (range: 5–25)	21.0(20.0,23.0)
Subscale: emotional (range: 8–40)	29.0(25.0,32.0)
Subscale: behavioral tendencies (range: 5–25)	20.0(17.0,21.0)
CWMB Scale (range:21–105)	74.0(68.0,81.0)
Subscale: WM superior (range: 10–50)	37.0(31.8,40.0)
Subscale: TCM superior (range: 11–55)	38.0(33.0,44.0)

Comparison of HCPs' Attitudes Between TCM and WM in the Treatment of HZ

Table 3 presents a comparison of HCP's attitudes between TCM and WM in the treatment of HZ. Nearly three-fifths of the respondents recognized the utility of WM in treating PHN (58.2%, 178/306). HCPs showed a nearly 50/50 split (48.4%, 148/306) on whether TCM was effective in treating PHN. Less than 50% of respondents agreed that the cost of TCM treatment was cheaper (43.5%, 133/306). More than three out of five respondents agreed that it's easy to understand the words of a WM doctor for patients with HZ (64.7%, 198/306). In contrast, only 46.4% (142/306) of respondents

Table 3 Comparison of HCP's Attitudes Between TCM and WM in the Treatment of HZ (n=306)

Items	N (%)
Recognition for the utility of WM in the treatments of PHN (yes)	178(58.2)
Recognition for the utility of TCM in the treatments of PHN (yes)	148(48.4)
It's cheaper to use TCM treatments than WM treatments for HZ patients. (yes)	133(43.5)
Finding a trustworthy TCM doctor in China is easy for HZ patients. (yes)	115(37.6)
It's easy to understand the words of a WM doctor for HZ patients. (yes)	198(64.7)
It's easy to understand the words of a TCM doctor for HZ patients. (yes)	142(46.4)

agreed that understanding the words of a TCM doctor for patients with HZ was easy. Only 37.6% (115/306) of the respondents thought it was easy to find a trusted TCM doctor for patients with HZ in China.

HCPs' Practice Regarding TCM and TCM Service for HZ

Table 4 shows HCP's practice regarding TCM and TCM service for HZ. Most of the respondents had experience in caring for or treating patients with HZ (72.2%,221/306) and PHN (64.1%, 196/306). Among respondents who had

Table 4 Practice of the HCPs Regarding TCM and TCM Service for HZ (n=306)

Items	N (%)
Experience in caring for/treating HZ patients (yes)	221(72.2)
Experience in caring for/treating HZ patients with TCM treatments (yes)	63(20.6)
Treated/cared for PHN (yes)	196(64.1)
Treatments used for PHN (n=196)	81(41.3)
TCM	
WM	63(32.1)
Integration of TCM and WM	52(26.5)
Experience in receiving TCM consultations for HZ (yes)	171(55.9)
Factors influencing referral/provision of TCM to patients	
PHN	185(60.5)
Erythema or papules(early)	170(55.6)
Acute pain	156(51.0)
Patient's wishes	116(37.9)
Broken skin	84(27.5)
Peer introduction	72(23.5)
Skin infections	64(20.9)
Advantages of the promotion of TCM for HZ	
Low side effects	209(68.3)
Early efficacy	200(65.4)
Good healing promotion	172(56.2)
Better complication prevention and control	158(51.6)
Low cost	150(49.0)
Good pain relief	152(49.7)
Factors hindering the promotion of TCM for HZ	
Lack of understanding of TCM treatment by healthcare professionals in WM	238(77.8)
Lack of understanding of TCM treatment by healthcare professionals in TCM	206(67.3)
Patients do not understand TCM treatments	194(63.4)
Patients are skeptical about TCM treatments	163(53.3)
Patients are not satisfied with the utility of TCM treatments	123(40.2)
Lack of evidence for the treatments of HZ in TCM	119(38.9)

(*Continued*)

Table 4 (Continued).

Items	N (%)
Further improvements for TCM and TCM service in HZ treatments	
Promoting public education on TCM	262(85.6)
Enhancing WM HCPs' understanding of TCM in HZ treatments	251(82.0)
Enhancing TCM training for TCM HCPs on the HZ treatments	241(78.8)
Provide further evidence of the utility of TCM treatments for HZ	221(72.2)
Expanding access to evidence-based TCM information	198(64.7)
Providing adequate professionals to ensure the quality of TCM services	190(62.1)

experience in caring for/treating HZ patients, they applied TCM treatments most (41.3%, 81/196). Over half of the respondents (55.9%, 171/306) had experience in receiving TCM consultations for HZ from the patients. More than half of the respondents considered the top 3 factors influencing their referral/provision of patients to TCM treatment, including PHN (60.5%, 185/306), early erythema or papules (55.6%, 170/306), and acute pain (51.0%, 156/306). Regarding the advantages of the promotion of TCM for HZ, the "low side effects" option was considered by most respondents (68.3%, 209/306). Over half of the respondents also agreed that many factors hinder the promotion of TCM treatment for HZ, including lack of understanding of TCM treatment by HCPs in WM (77.8%, 238/306), lack of understanding of TCM treatment by HCPs in TCM (67.3%, 206/306), patients do not understand TCM treatment (63.4%, 194/306), and patients are skeptical about TCM treatment (53.3%, 163/306). To enhance TCM service for HZ, most respondents believed that more professional education in TCM was needed for the public (85.6%, 262/306), WM HCPs (82.0%,251/306), TCM HCPs (78.8%, 241/306). Nearly three-quarters of the respondents (72.2%, 221/306) felt that it was necessary to provide further evidence of the utility of TCM treatment for HZ.

Differences in Perception, Attitude, and Practice Regarding TCM and TCM Service for HZ Among the Doctors and Nurses

Table 5 shows the perception, attitude, and practice regarding TCM and TCM service for HZ among the doctors and nurses. Compared to nurses, doctors were more likely to recommend TCM services to acute patients (50.3% vs 25.5%, $P<0.001$). Doctors had statistically significantly more knowledge about HZ treatments than nurses, including Chinese herbal medicine (71.5% vs 53.6%, $P=0.002$), acupuncture (61.1% vs 35.8%, $P<0.001$), blood-letting puncture and cupping (45.1% vs 23.2%, $P<0.001$), fire needle therapy (47.9% vs 19.9%, $P<0.001$), lamp moxibustion (32.6% vs 8.6%, $P<0.001$), and cotton moxibustion (16.7% vs 7.9%, $P=0.022$). Compared to nurses, doctors were more likely to recognize the effectiveness of TCM for HZ (74.5% vs 45.3%, $P<0.001$), while we are less likely to recognize that for PHN (34.5% vs 60.9%, $P<0.001$). Doctors reported higher recognition of the safety of TCM than nurses (86.2% vs 68.3%, $P<0.001$). In comparison with nurses, doctors showed more agreement on the advantages of TCM treatments to HZ patients, including better for HZ crusting and healing (71.0% vs 52.8%, $P=0.001$), mitigating the complication (71.0% vs 49.7%, $P<0.001$), better pain relief (67.6% vs 49.7%, $P=0.002$), shortening the duration of disease (64.8% vs 36.0%, $P < 0.001$), and promoting ulcer healing (53.1% vs 33.5%, $P<0.001$). Besides, doctors tend to show more willingness to recommend TCM treatments to HZ patients than nurses (89.0% vs 75.8%, $P=0.003$). When accounting for referral/provision of TCM to HZ patients, doctors tend to be more concerned with patient's pain symptoms than nurses, including PHN (73.8% vs 48.4%, $P<0.001$) and acute pain (60.7% vs 42.2%, $P=0.001$). In addition, early erythema or papules (62.1% vs 49.7%, $P=0.030$) and broken skin (33.1% vs 22.4%, $P=0.035$) were also more likely to be concerned by doctors when considering referring or providing HZ patients with TCM treatments. In contrast with nurses, doctors were more likely to agree that it is cheaper to use TCM treatments than WM treatments for HZ patients (51.7% vs 36.0%, $P=0.006$).

Table 5 Difference of Knowledge, Attitude, and Practice Regarding TCM and TCM Service for HZ Between Nurses and Doctors (n=306)

Items	Nurses (n=161)	Doctors (n=145)	X^2	*P*
	N(%)	N(%)		
Recommend TCM services to acute patients (yes)	41(25.5)	73(50.3)	20.20	<0.001***
Knowledge about HZ treatments				
Western medicine	135(89.4)	134(93.1)	1.22	0.269
Chinese herbal medicine	81(53.6)	103(71.5)	10.05	0.002**
Acupuncture	54(35.8)	88(61.1)	18.97	< 0.001***
Blood-letting puncture and cupping	35(23.2)	65(45.1)	15.86	<0.001***
Fire needle therapy	30(19.9)	69(47.9)	26.01	<0.001***
Lamp moxibustion	13(8.6)	47(32.6)	26.27	<0.001***
Cotton moxibustion	12(7.9)	24(16.7)	5.23	0.022*
Effectiveness of TCM for HZ (yes)	73(45.3)	108(74.5)	27.56	<0.001***
Effectiveness of TCM for PHN (yes)	98(60.9)	50(34.5)	21.27	<0.001***
Recognition for the safety of TCM (yes)	110(68.3)	125(86.2)	13.69	<0.001***
Advantages of TCM treatments to HZ patients				
Better for HZ crusting and healing	85(52.8)	103(71.0)	10.71	0.001**
Mitigating the complication	80(49.7)	103(71.0)	14.46	<0.001***
Better pain relief	80(49.7)	98(67.6)	10.04	0.002**
Shortening the duration of disease	58(36.0)	94(64.8)	25.32	<0.001***
Promoting ulcer healing	54(33.5)	77(53.1)	11.93	<0.001***
Anti-infection	49(30.4)	54(37.3)	1.58	0.208
Recommendation for patients to treat HZ with TCM (yes)	122(75.8)	129(89.0)	9.00	0.003**
Factors influencing referral/provision of TCM to patients				
Erythema or papules(early)	80(49.7)	90(62.1)	4.74	0.030*
PHN	78(48.4)	107(73.8)	20.50	<0.001***
Acute pain	68(42.2)	88(60.7)	10.40	0.001**
Patient's wishes	61(37.9)	55(37.9)	0.00	0.994
Peer introduction	39(24.2)	33(22.8)	0.09	0.763
Broken skin	36(22.4)	48(33.1)	4.42	0.035*
Skin infections	27(16.8)	37(25.5)	3.53	0.060
It's cheaper to use TCM treatments than WM treatments for patients with HZ. (yes)	58(36.0)	75(51.7)	7.65	0.006**

Note: *$P < 0.05$*, $P < 0.01$**, $P < 0.001$***.

Discussion

This study provides a comprehension of perceptions, attitudes, beliefs, and practices regarding TCM and TCM service for HZ among HCPs. HCPs had positive views on TCM for treating HZ but did not use it frequently. Customized promotion and training might help improve its effectiveness.

Overall, most respondents reported a preference for recommending TCM services to chronic disease patients. This ratio is similar to the findings of a previous study conducted in China, where 97.7% of chronic disease patients were recommended TCM.[47] TCM prioritizes gentle methods with minimal side effects to gradually and effectively rebalance the body, even if it takes longer than WM.[48] Most respondents were more familiar with WM treatments for HZ and PHN instead of specialized TCM treatments, possibly due to a majority of HCPs working in the WM departments. HCPs typically approach problems in a WM style, drawing on various disciplines such as anatomy, histology, embryology, biochemistry, and molecular biology. Despite having participated in TCM optional programmes during their studies in WM institutions of higher learning, HCPs tend to rely on WM principles in their practice.

Generally, the most important concern regarding the impact of medical treatment choice on a patient's health is its effect on their clinical manifestations.[49] The preference of HCPs for WM in the treatment of HZ and PHN may be due to the tendency to seek quick solutions for health problems in busy cities. The Chinese government has been promoting the integration of WM and TCM. During the COVID-19 outbreak period, a model was developed for the effective use of both TCM and WM in China. TCM therapies have proven to be useful in reducing the hospitalization period for mild and moderate cases, preventing high-risk patients from becoming seriously ill, and reducing the mortality rate for critical and severe cases, as well as effective in alleviating the aftereffects.[50] It may be helpful for HCPs to establish treatment programs that are tailored to the severity of a patient's herpes zoster disease. WM could be used to achieve rapid treatment results, while TCM could be employed to alleviate after-effects and improve the patient's quality of life.

Further, many respondents thought HZ patients had difficulty finding trustworthy TCM doctors. Evidence showed that most TCM-trained students are general undergraduates and continuing education undergraduates, with only 0.7% being PhD students.[25] Building a great staff would be the cornerstone of TCM's revival. Therefore, it is crucial to develop top-tier TCM talents, and master's and Ph.D. students, and steadily raise their academic standing.

Additionally, many of the respondents felt that HZ patients had a harder time understanding a TCM doctor's remarks than a WM doctor, which may be at odds with earlier results.[51] It has been shown that TCM practitioners have better communication skills than their Western counterparts, which positively impacts their interactions with patients.[51] Effective medical communication can impact treatment adherence, satisfaction, and pain management outcomes.[52] In China, HCPs are mainly trained to communicate direct medical information rather than address patients' emotional needs. To implement communication training materials or create communication standards, such as the Calgary-Cambridge Guides that will eventually be used in English-speaking nations, it is also required to adapt the TCM training materials. Overall, the views, beliefs, and favorable attitudes of HCPs towards TCM and TCM treatments for HZ patients were comparably high.

Most respondents had experience in seeing or caring for HZ patients, but the frequency of experience with PHN was at a low level. This may be associated with the PHN patients' disappointment with the perceived effectiveness of their pain management interventions,[53] and their compliance with treatments may decrease with time going by. The limited practical experience of HCPs may have restricted their knowledge of the efficacy of different herpes zoster treatments and prevented them from exploring TCM or its integration with WM. In recent years, TCM treatments such as acupuncture, Chinese herbal medicine, moxibustion combined with cupping, etc. have demonstrated a unique and accurate effect in treating PHN and zoster-associated pain with low side effects.[54] That may explain why PHN is the main factor when HCPs consider referral or provision of TCM to patients. However, some respondents did not recognize the benefits of TCM treatments for HZ, which was probably due to the lack of evidence-based information on TCM treatments for HZ.[19,55] More research with higher-quality evidence is needed to help HCPs decide whether to adopt TCM treatments.

The behaviors of HCPs, particularly nurses and doctors who are at the forefront of providing healthcare, are crucial in determining how well patients are treated. It is worth noting that we found significant differences in the perceptions, attitudes, and practices of nurses and doctors towards TCM and TCM services for HZ. Doctors demonstrated a greater degree of expertise and more recognition of TCM and TCM care for HZ than did nurses. Throughout the literature review, it may be explained that nurses lack the TCM knowledge, education, training, institutional support, and resources they need for TCM discussions with patients.[56] To address the challenge of inadequate familiarity with and knowledge of TCM, continuing education in TCM is recommended for the above-mentioned targeted HCPs. It would be better if the government not only increased training opportunities, but also improved training content, made skills training a priority, and tailored training content to suit each worker's needs.

It's widely acknowledged that TCM plays an important role in pain management.[15] The majority of doctors considered TCM therapy to be affordable, while nurses held the opposite viewpoint. Whether in TCM departments from public hospitals or private TCM clinics, patients were required to pay themselves for TCM treatment, resulting in a greater financial burden.[57] To date, National Health Insurance has covered a series of TCM treatments in China, including Chinese herbal medicine, acupuncture, etc. This may partly explain why some HCPs did not consider TCM recommendations for HZ patients. To make TCM treatments more accessible to patients, we hope to see more TCM

treatments covered under National Health Insurance in the future. Divided opinions on TCM and TCM services for HZ patients sometimes may cause relatively ineffective doctor-nurse cooperation and communication, which could hurt patients' treatments. Standardizing the TCM training courses for HCPs is necessary.

Though HCPs presented comparatively high perceptions, beliefs, and positive attitudes toward TCM and TCM services for HZ patients, we found HCPs knew less specific TCM treatments for HZ patients. Abundant TCM expertise for HZ treatments possibly helps a lot with maximizing the utility of TCM. For example, the knowledge of specific TCM treatments is needed to design compulsory medical curricula and continuing education activities. Then HZ patients possibly will be treated with the relatively optimal method, cost-effective combination therapy. The higher the HZ patients' satisfaction regarding the quality of TCM services is, the higher the HZ patients' loyalty to TCM.[58] In this way, the impact of TCM can be extended even more. At the same time, various forms of publicity activities (eg lectures) should be carried out regularly and continuously to promote TCM treatments for HZ among both HCPs and patients.

There were several limitations in this study. Although we designed the multiple-centered study, due to China's vast territory and regional economic imbalance, the online survey with snowballing sampling resulted in a sample that lacked the representativeness of all Chinese HCPs fully. Additionally, respondents' recall bias may have limited the accuracy of findings in this survey, for example, reporting practice regarding TCM and TCM service for HZ. The related evidence needs to be validated in further multi-center, large-sample surveys in the future.

Conclusions

The findings of this study indicated that a moderately satisfactory degree of comprehension and favorable dispositions existed towards TCM and its services among HCPs in HZ. Nevertheless, a majority of respondents lacked practical experience in administering specific TCM treatments to HZ patients. Tailored programs for high-quality evidence-based TCM treatments regarding HZ to deliver scientific information should be developed and evaluated, to improve the effectiveness and feasibility of HCPs' efforts to enhance clinical adoption and dissemination of TCM treatments for HZ patients.

Data Sharing Statement

The data will be shared on reasonable request to the corresponding author.

Ethics Statement

The research was reviewed and approved by the Ethics Committee of Sun Yat-sen Memorial Hospital, Sun Yat-sen University (ID: SYSEC-KY-KS-2021-183) and registered with the Chinese Register for Clinical Studies (ID: ChiCTR2100050476).

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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