Original Article

A national survey on how to improve traditional Chinese medicine learning internationally: Perceptions from both teachers and students

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A B S T R A C T

Background: With the increasing popularity of traditional Chinese medicine (TCM) by the global community, how to teach basic knowledge of TCM to international students and improve the teaching quality are important issues for teachers of TCM. The present study was to analyze the perceptions from both students and teachers on how to improve TCM learning internationally.

Methods: A cross-sectional national survey was conducted at 23 universities/colleges across China. A structured, self-reported on-line questionnaire was administered to 34 Chinese teachers who taught TCM course in English and to 1016 international undergraduates who were enrolled in the TCM course in China between 2017 and 2021.

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1. Introduction

Traditional Chinese medicine (TCM) has gained increasing acceptance and popularity by the global community. Youyou Tu won the 2015 Nobel Prize in Physiology or Medicine for the discovery of artemisinin. TCM education is not only an important part of biomedical education in China, but also popularized in many other countries around the world. According to Ministry of Education of the People’s Republic of China, China is now one of the biggest study abroad destinations with a total number of 492,185 international students in 2018. In the 2021–2022 academic year, the Ministry of Education of the People’s Republic of China entrusted 45 universities, or colleges to enroll 3037 international student in China of undergraduate medical education in English for Bachelor of Medicine and Bachelor of Surgery (MBBS) degree. From the interim provisions for quality control standards, international graduates of the undergraduate medical program shall demonstrate the knowledge and understanding the basic characteristics of TCM and its application based on an overall analysis of the patient’s condition. TCM education can not only increase the students’ understanding of Chinese medicine and broaden their medical horizons, but also help them understand Chinese culture, which has become one of the teaching features of studying in China.

TCM education for international students is an arduous task for universities and teachers. The differences in cultural backgrounds, the problems of language communication, the limitations of traditional teaching methods and the lack of standardized teaching materials have become the main obstacles for international students to understand the theories of TCM. How to use the limited class hours to teach the basic knowledge of TCM to international students majoring in conventional medicine, to stimulate their enthusiasm for learning TCM, and to improve the teaching quality, are important issues for teachers of TCM. The teachers have been making continuous efforts to help international students better understand and master TCM.

The key elements to improve the quality of course education include exploring the interest of students in learning TCM, understanding their learning barriers and needs, increasing the cognitive and expressive ability of teachers, and improving the teaching methods according to the needs of students. Therefore, a large-scale questionnaire survey was conducted to analyze the perceptions from both students and teachers on how to improve TCM learning among international undergraduates majoring in conventional medicine based on a national survey in China.

2. Methods

2.1. Study design

A cross-sectional national survey was conducted at 23 universities, or colleges from 14 provinces, autonomous region, and municipalities in the People’s Republic of China, including Anhui, Fujian, Guangdong, Heilongjiang, Jiangsu, Jilin, Liaoning, Shan-dong, Sichuan, Yunnan and Zhejiang provinces; Xinjiang uyghur autonomous region; Beijing and Chongqing municipalities.

A structured, self-reported on-line questionnaire by the Web-based survey tool Sojump (Changsha ran Xing Infotech Ltd, China, shown as Suplement 1) was handed out during April 11 to May 4, 2022 to the international undergraduates who were enrolled in TCM course between 2017 and 2021, and to Chinese teachers who taught TCM course to international undergraduates majoring in conventional medicine in English during the same period. Demographic data and the perceptions on how to improve TCM learning among international undergraduates majoring in conventional medicine within the structured questionnaire were obtained to conduct the analysis.

As there is no recognized authoritative questionnaire on TCM learning assessment, the anonymous structured questionnaire was designed according to the objective of the study. All the items within the questionnaire originated from the consensus of a panel of Chinese teachers who taught TCM course to international undergraduates majoring in conventional medicine in English across China. The consensus was based on a specific training (File No. 2021) 904) held by Ministry of Education of the People’s Republic of China for the teachers during October 20 to November 16, 2021, in Zhejiang University, Hangzhou, China. Based above, the final consensus was reached through the following two rounds of on-line discussion. Prior to distribution, the questionnaire was sent to 26 TCM educators and undergraduates to determine its validity and consistency.

The questionnaire comprised 13 questions, including 5 demographic data questions on age, gender, major, university and country of origin, and 8 close-ended questions consisting of 7 single choice and 1 multiple choice. The close-ended questions aimed to investigate the international undergraduates’ perception on integration of Chinese culture into TCM course, the comparison of traditional medicine in different countries with TCM, the significance of clinical practice and modern research in TCM course, the application of the practical teaching method with case reports, the learning styles benefiting the undergraduates most, the learning modes, and the contents those the international undergraduates
were interested in the TCM course. Chinese teachers and international undergraduates who were willing to participate in the study completed and returned the questionnaire. The last 3 questions were not available to the teachers due to the applicability.

2.2. Statistical analysis

Continuous data were expressed as mean ± standard deviation (SD) and were analyzed using t-test. Categorical data were presented as frequency and percentage (%) and were assessed using the Chi-square test or Fisher exact test for expected frequencies of less than five. All statistical calculations were performed using IBM SPSS computer program (Statistical Package for the Social Sciences; IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). All statistical tests were two-sided, and \( P < 0.05 \) was considered as statistically significant.

3. Results

Thirty-four Chinese teachers were included in the survey. A total of 1016 international undergraduates from 46 countries (From A to Z: Angola, Australia, Bahamas, Bangladesh, Botswana, Canada, Comoros, Congo, Congo(Kinshasa), Egypt, Ethiopia, France, Ghana, Greece, India, Indonesia, Iran, Iraq, Kenya, Kuwait, Lebanon, Malaysia, Mongolia, Myanmar, Nepal, Nigeria, Pakistan, Republic of Korea, Russia, Rwanda, Saudi Arabia, Somalia, South Africa, Spain, Sri Lanka, Swaziland, Syrian, Tanzania, Thailand, Turkey, Uganda, United Kingdom, United States of America, Yemen, Zambia, Zimbabwe) responded to the questionnaire. All the teachers and undergraduates majored in medicine.

Among the international undergraduates, 482 (47.4%) were males and 534 (52.6%) were females. Among Chinese teachers, 10 (29.4%) were males and 24 (70.6%) were females. The mean (SD) age of the Chinese teachers and international undergraduates was respectively of 36.8 (6.3) and 22.7 (2.0) years. The mean (SD) age of the male international undergraduates and female international undergraduates was respectively of 22.7(2.1) and 22.6 (2.0) years old.

3.1. The perceptions on integration of traditional Chinese culture into TCM course from both teachers and undergraduates

As shown in Table 1, 33 of 34 teachers (97.1%) agreed Chinese culture should be fully integrated into TCM courses and 900 of 1016 undergraduates (88.6%) agreed with this. There were no significant differences between teachers and undergraduates \((P > 0.05)\). As shown in Table 2, there were no gender disparities in the undergraduates \((P > 0.05)\).

3.2. The perceptions on comparison of traditional medicine in different countries with TCM from the teachers and undergraduates

As shown in Table 1, 33 of 34 teachers (97.1%) thought comparing traditional medicine in different countries with TCM can help the undergraduates better understand TCM and 959 of 1016 undergraduates (94.4%) agreed with this. There were no significant differences between the teachers and undergraduates \((P > 0.05)\). As shown in Table 2, there were no gender disparities in undergraduates \((P > 0.05)\).

3.3. The perceptions on the significance of clinical practice in TCM course from the teachers and undergraduates

As shown in Table 1, all the teachers thought that TCM had important significance in the clinical practice, and among the undergraduates, 944 of them (92.9%) had the opinion. There were no significant differences between teachers and undergraduates \((P > 0.05)\). As shown in Table 2, 95.1% of the female undergraduates and 90.5% of the male undergraduates agreed clinical practice is very important in the TCM course, which had significant difference \((P = 0.004)\).

3.4. The perceptions on application of the practical teaching method with case reports from both teachers and undergraduates

As shown in Table 1, 32 of 34 teachers (94.1%) agreed that the practical teaching method with case reports should be used and 962 of 1016 undergraduates (94.7%) agreed with this. There were no significant differences between teachers and undergraduates \((P > 0.05)\). As shown in Table 2, there were no gender disparities in undergraduates \((P > 0.05)\).

3.5. The perceptions on the significance of modern research in TCM course from the teachers and undergraduates

As shown in Table 1, all the teachers agreed that modern research of TCM is valuable and 995 of 1016 undergraduates (97.9%) had the perception. There were no significant differences between
teachers and undergraduates \( P > 0.05 \). As shown in Table 2, 99.1% of the female undergraduates and 96.7% of the male undergraduates agreed on the key roles of modern research in the TCM course, which had significant statistical difference \( P = 0.008 \).

### 3.6. The perceptions on the learning modes as the first choice from the undergraduates

As shown in Table 3, from the perceptions of the undergraduates, they prefer to participate in face-to-face teaching (82.3%). As shown in Table 2, there were no gender disparities in the undergraduates \( P > 0.05 \).

### 3.7. The perceptions on the beneficial learning styles from the undergraduates

As shown in Table 3, from the perceptions of the undergraduates, the top three learning styles benefitting the undergraduates most were practice (34.3%), teacher’s lectures (32.5%), and case studies (10.4%). As shown in Table 2, there were no gender disparities in the undergraduates \( P > 0.05 \).

### 3.8. The contents those the international undergraduates were interested in

As shown in Table 3, the top three contents those the international undergraduates were interested in were acupuncture (75.5%), Chinese herbal medicine (63.8%), and massage (55.0%). As shown in Table 2, 79.4% of female undergraduates and 71.2% of male undergraduates were interested in acupuncture, which had significant difference \( P = 0.002 \); moreover, 58.1% of female undergraduates and 51.7% of male undergraduates were interested in massage, which had significant difference \( P = 0.041 \).

### 4. Discussion

As globalization has created opportunities for the communication of TCM and Chinese culture, integrating Chinese culture into TCM courses can not only help international students better understand Chinese medicine, but also help improve their cross-cultural adaptability in China.

Case-based learning can well link theory to practice through application of knowledge to the cases and inquiry-based learning methods. To improve TCM learning among international undergraduates majoring in conventional medicine, the practice courses should be arranged after the theory study of TCM, and the interval should not be too long, so that the students can consolidate the knowledge they have learned. In clinical practice, the international students can be familiar with the process of four ways of diagnosis in TCM, and can conduct syndrome differentiation under the guidance of teachers, which can deepen students’ understanding of theoretical knowledge and help them master the TCM knowledge.

TCM treatments, such as acupuncture, moxibustion, cupping, scraping can be experienced by international students, which can better stimulate their interests in learning TCM.

To the best knowledge of us, the present survey is the first, multi-center and large-scale one on TCM education. The teachers in this study came from 14 regions of China, and the students in

### Table 2

Characteristics and perceptions from the international undergraduates subdivided by gender.

| Items                                                                 | International undergraduates No. (%) | Male (n = 482) | Female (n = 534) | \( P \)-value |
|-----------------------------------------------------------------------|-------------------------------------|---------------|-----------------|--------------|
| Age, Mean (SD), years                                                |                                     |               |                 |              |
| Do you think Chinese culture should be fully integrated into TCM courses? |                                     |               |                 |              |
| Yes                                                                  | 22.7 (2.1)                          | 22.6 (2.0)    |                 | 0.527\(^{b}\) |
| No                                                                   | 419 (86.9)                          | 481 (90.1)    |                 | 0.115\(^{c}\) |
| Do you think comparing traditional medicine in different countries with TCM can help you better understand TCM? |                                     |               |                 |              |
| No                                                                   | 63 (13.1)                           | 53 (9.9)      |                 | 0.419 \(^{c}\) |
| Yes                                                                  | 452 (93.8)                          | 507 (94.9)    |                 |              |
| Do you think TCM has important significance in the clinical practice? |                                     |               |                 |              |
| No                                                                   | 30 (6.2)                            | 27 (5.1)      |                 | 0.004 \(^{c}\) |
| Yes                                                                  | 436 (90.5)                          | 508 (95.1)    |                 |              |
| Do you agree with the practical teaching method with case reports?   |                                     |               |                 |              |
| No                                                                   | 46 (9.5)                            | 26 (4.9)      |                 | 0.915 \(^{c}\) |
| Yes                                                                  | 456 (94.6)                          | 506 (94.8)    |                 |              |
| Which one of the following learning modes do you prefer as the first choice? |                                     |               |                 |              |
| Attending to face-to-face teaching                                   | 397 (82.4)                          | 439 (82.2)    |                 | 0.998 \(^{c}\) |
| Watching live broadcast class                                        | 34 (7.1)                            | 38 (7.1)      |                 |              |
| Teacher’s lectures                                                    | 165 (34.2)                          | 165 (30.9)    |                 | 0.417 \(^{c}\) |
| Practice                                                             | 165 (34.2)                          | 183 (34.3)    |                 |              |
| Student’s presentation                                               | 6 (1.2)                             | 13 (2.4)      |                 |              |
| Interactions and communications                                      | 48 (10.0)                           | 44 (8.2)      |                 |              |
| Video demonstrations                                                  | 20 (4.1)                            | 39 (7.3)      |                 |              |
| Case studies                                                         |                                     |               |                 |              |
| 49 (10.2)                                                            | 57 (10.7)                           | 11 (2.1)      |                 |              |
| Group learning                                                       | 10 (2.1)                            | 11 (2.1)      |                 |              |
| Homework                                                             | 11 (2.3)                            | 10 (1.9)      |                 |              |
| Thesis                                                               | 2 (0.4)                             | 5 (0.9)       |                 |              |
| Other                                                                | 6 (1.2)                             | 7 (1.3)       |                 |              |
| Which of the following contents are you interested in? [Multiple]    |                                     |               |                 |              |
| Acupuncture                                                         | 343 (71.2)                          | 424 (79.4)    |                 | 0.002 \(^{c}\) |
| Chinese herbal medicine                                              | 295 (61.2)                          | 353 (66.1)    |                 | 0.105 \(^{c}\) |
| Massage                                                              | 249 (51.7)                          | 310 (58.1)    |                 | 0.041 \(^{c}\) |

Abbreviations: TCM, traditional Chinese Medicine.

\(^{a}\)All tests were 2-sided, \( P < 0.05 \) was considered to be significant.

\(^{b}\)Calculated using an unpaired, 2-tailed t-test.

\(^{c}\)Calculated using Chi-square test.
this study were from 46 countries around the world. We found the teachers and the international undergraduates majoring in conventional medicine had the same views on improving TCM learning, which may provide evidence for improving the TCM learning among international students in future.

This study had several limitations. First, although all the items within the questionnaire originated from the consensus of a panel of Chinese teachers who taught TCM courses to international undergraduates majoring in conventional medicine across China, some potentially important items might not be included in the survey. Second, a detailed analysis was not conducted to explore the possible differences in responses depending on the country of origin or ethnicity of the participants, as the respondents from some countries may already be familiar with TCM. Third, due to the non-comparative feature, the validity of the questionnaire was not fully determined, and the self-administered questionnaire might lead to potential information bias from the participants. Fourth, more educational and professional backgrounding information of the participants should be collected, which may possess influences on their perceptions on how to improve TCM learning among international undergraduates majoring in conventional medicine. Fifth, as the included teachers and international students came from 23 universities, or colleges across China, there may exist more or less differences in the teaching protocols among various institutes, which may induce bias to the conclusion.

In conclusion, to improve TCM learning among international undergraduates majoring in conventional medicine in China, integration of Chinese culture into TCM course, comparison of traditional medicine in different countries with TCM, application of the teaching method with case reports, and emphasis of clinical practice as well as modern research on TCM with the top learning style as practice, teacher’s lectures and case studies should be fully considered.

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Author contributions

Conceptualization: FQ. Methodology: YHZ, Y(an)W, FFW, FQ. Formal analysis: Y(an)W, FFW. Investigation: HZ, Y(an)JFZ, YL, WH, PL, HYW, Y(ing)W, BDZ, YJW, HWY, JPZ, wQL, Y(u)FZ, JZ, YDS, YYS, XZ, XS, SY, LY, ZBG, KL, JLC, WJX, WLW and YEG. Data curation: Y(an)W, FFW. Writing - Original Draft: YHZ, FQ. Writing - Review & Editing: XRX, FQ. Visualization: FQ. Supervision: FQ. Project administration: XRX, FQ. Funding acquisition: FQ.

Conflict of interest

All authors declared no competing interests.

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Ethical statement

This study obtained informed consent from Chinese teachers and international undergraduates enrolled in the study and completed the questionnaire voluntarily. The study protocol and implementation process were approved and supervised by the Institutional Review Board (IRB) of Education Department, Women's Hospital, School of Medicine, Zhejiang University (No. TEIRB-20211201).

Data availability

All the data used to support the findings of this study are available from the corresponding author upon reasonable request.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.imr.2022.100895. Supplement 1. Questionnaire

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