

Is it Necessary and Feasible to Develop Traditional Chinese Medicine Scientific and Technological Industry in Macau—A Systematical Analysis

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Abstract: The present study aims to explore the potential development of traditional Chinese medicine (TCM) science and technology industry in Macau. First, we analyzed the medical statistics of TCM industry in a recent decade. Then, the internal and external environment of Macau were analyzed using the SWOT analysis. Finally, the current research offered potential strategies for TCM improvement in Macau. The findings of this study indicate that although the development of TCM industry in Macao is still at the growth stage, it progresses gradually, steadily and positively with great potential. In the future, the industry in Macao should take its geographical and linguistic advantages to improve the connotation and status and it should optimize its own service level and seize external opportunities.

1. Introduction

In recent years, traditional Chinese medicine (TCM) has been developed in various aspects. Thus, it consistently stimulates the development of TCM industry in Macao from non-standardization to specialization and standardization. The natural environment of Macau, such as history, economy and human geography, is the most crucial element of the social development since ancient times. Macau was captured as the colony by Portuguese in Ming dynasty, making it become the first window to communicate with outside world. As it has been occupied by eastern and western civilization for nearly 500 years, its geographical and historical advantages have facilitated the development of TCM industry. In Qing dynasty, a large number of Jesuits carried out a number of sinology studies that became the starting point of TCM in Macao. Over the years, the development of TCM industry in Macao has suffered from numerous difficulties and gradually become standardization. This study aims to analyze the medical related statistics in recent decades to summarize the current internal and external environment of Macau, as well as to provide some recommendations for its healthy and sustainable development.

2. Development Status

2.1 Industry Scale.

TCM in Macau involves Chinese herbal medicine factories, herb shop, pharmacy and TCM selling. The number of herb shop and pharmacy is relatively stable in the recent ten years. However, there has been a rapid decline in medicine factory since 2013. And all Chinese and western pharmaceutical factories were closed by 2017 (Fig. 1, Fig. 2), since the scale of Chinese medicine industry in Macao is limited and the cooperation between Macao and mainland China has become more frequently. In contrast, raising numbers of visitors and the recognition of residents results in the increase of the TCM retail scale. The turnover of pharmacy in 2017 were 190 million Macao patacas, accounting for 2.9% of the total retail selling of Macao.

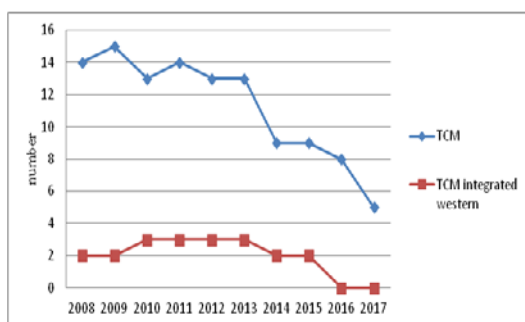


Fig. 1 Medicine factory statistics in Macau from 2008 to 2017

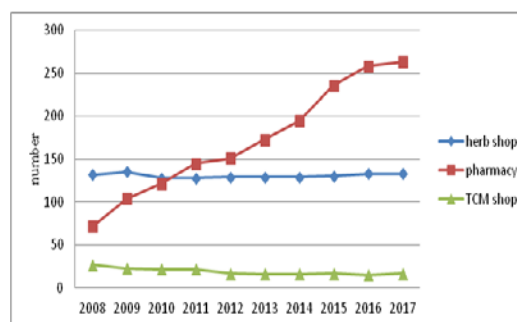


Fig. 2 Medicine related shops in Macau from 2008 to 2017

In addition, with the Guangdong-Hong Kong-Macao Greater Bay Area being set up, a number of opportunities occurs to stimulate the development of TCM industry in Macao. For example, the TCM scientific and technological industrial park, which is the cooperation between Guangdong and Macau, has been established in 2011. Then, the world health organization collaborating center for traditional medicine has also been set up in 2015. The Guangdong-Hong Kong-Macao Greater Bay Area TCM innovation program, which aims to integrate the clinic-industrialization-scientific research was found in 2018 as well. Therefore, Macao could gain tremendous new growth points via these platform for the TCM industry.

2.2 Medical Service System.

In the middle of the 19th century, there were only three western hospitals in Macao. However, Chinese people refused and resisted the treatment from these to Portuguese hospitals as they believed that if they died in the hospitals, misfortune may happen around them. Therefore, Chinese communities set up some social charity organizations spontaneously to offer free medical care and TCM service for general publics. Up to now, it presents the diversity of medical services in Macao. The free fundamental medical services provided by SAR government combined with the high-end medical services provided by private institutions constitute the medical system of TCM in Macao. From 2008 to 2017, the decline of traditional Chinese medicine clinics was stable, while the decrease of western medicine clinics was obvious, and the number of comprehensive clinics increased significantly (Fig. 3). It can be seen that TCM is still one of the main ways for Macau patients to choose.

- The governmental hospital (Centros de Saúde, general health care department) is covered by high medical insurance
- The non-governmental TCM treatments offer by charity organization (e.g. Association of Returned Overseas Chinese Macau, Tong shan tang) could provide free medical care
- Traditional integrated western hospitals run by private institutions (e.g. Kiang Wu Hospital and University Hospital).
- Private clinic and pharmacy medical services (e.g. Beijing Tong RenTang)

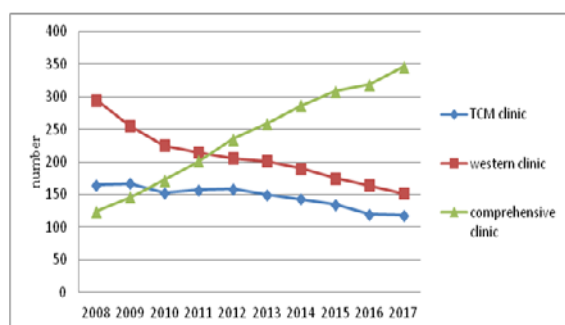


Fig. 3 Clinic statistics in Macau from 2008 to 2017

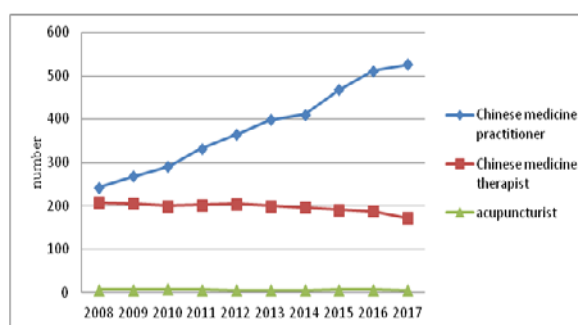


Fig. 4 TCM related practitioners in Macau from 2008 to 2017

2.3 TCM Practitioners.

At present, TCM practitioners are divided into Chinese medicine practitioner, Chinese medicine therapist and acupuncturist. Chinese medicine practitioner refers to those who receives professional TCM education in colleges or universities, while Chinese medicine therapist is not. By the end of 2017, there were 526 registered Chinese medicine practitioners in Macao, which has increased dramatically in the past decade, while the number of Chinese medicine therapist has decreased slightly, and acupuncturist has not changed much (Fig. 4). There are several Chinese medicine practitioners provide services to residents in Macau, but the ability of practitioners is uneven, transferring the knowledge from fathers to sons is very common in family-owned TCM situation. It shows a slight progress of TCM practitioners until the traditional Chinese medicine association invited expert team from mainland for training and Macau residents study TCM major in mainland.

2.4 Residents Recognition.

Macao TCM service, which offered stemming from the charity organization, has accumulated mass recognition in its improvement. The number of TCM patients registered in Macao health center increased sharply from 2008 to 2013, after 2013, the growth rate tended to be stably increased with each passing year, accounting for a continuous raising in the total number of patients (Fig. 5). In addition, the local market and the Macao proprietary Chinese medicines and traditional medicines legally import and sell increased rapidly from 2008 to 2017, and stabilized at more than 7000 kinds after 2016 (Fig. 6). It can be seen that Macao has a high demand for TCM not only TCM herbs but also patients seeking TCM for treatment, which are increasing year by year, and TCM services are highly recognized among the Macao residents.

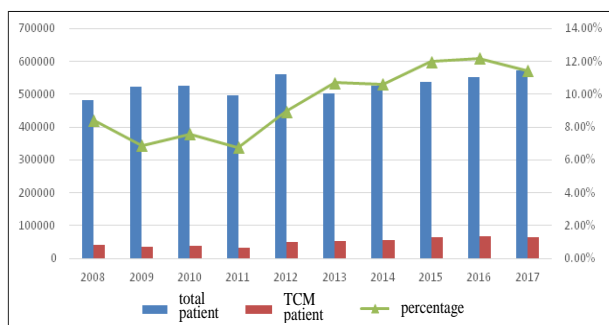


Fig. 5 The number of medical consultations in Macau from 2008 to 2017

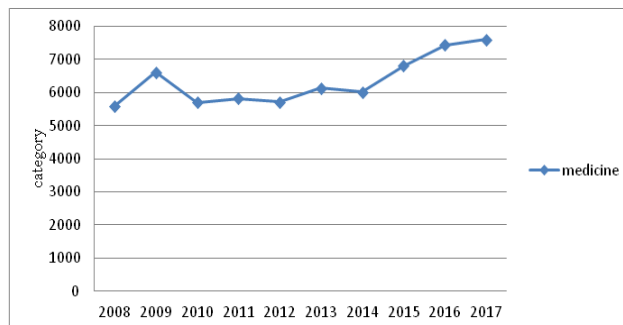


Fig. 6 The number of Chinese herb legislated in Macau from 2008 to 2017

2.5 Medical Insurance.

The total expenditure of the Macau health bureau in 2017 was about 6.63 billion patacas, up 5.19 percent from 2016. Macao residents have achieved full coverage of medical insurance. In 2009, the government launched the "medical subsidy scheme", which mentioned every permanent resident of Macao was received 600 mop of medical vouchers every year, which could be used in medical cooperation unit. In 2018, electronic medical vouchers were first launched, and 239 TCM clinics participated in the plan. The amount of recovered coupons of TCM accounted for 30% of the total amount, much higher than the 15% of western medicine. However, the capacity of free medical services provided by SAR government are limited. The problem of population growth and aging population aggravates the demand of TCM for curing diseases. There is an urgent need to improve the quality of local TCM medical service institutions and practitioners, otherwise residents will turn to Hong Kong or the mainland for TCM treatment.

2.6 TCM Legislation.

Medicine regulation. There is no legal definition of Chinese patent medicine in Macao. In addition, registration system has not been launched. Macao and Portugal are friendly neighbors so that the import and export of traditional Chinese medicine has never been legislated. Therefore,

Macao's TCM registration generally adopts the "alternative registration system" [4]. Although Macao is the only region in Asia where there is no legislation on the registration of TCM, the regulations on TCM are relatively strict but also limited. For example, "No.7/89/M" "No. 30/95/M" control medicine advertising, "No. 58/90/M" "No.20/91/M" "No.21/2003" "No.1/2009" regulate TCM industry, "No.59/90/M" define TCM registration affairs, "No. 53/94/M" approves for trading in pharmaceutical preparation of TCM and operation conditions, "No.7/2003" "No.3/2016" supervise the import and export of TCM.

Practitioner regulation. Registration is required for TCM practitioners (Chinese medicine practitioner, Chinese medicine therapist and acupuncturist.) in Macau, however, the registration process is quite simple. "No.20/98/M" "No. 84/90/M" define requirements of TCM practitioners. "No.26/2003" regulates academic qualifications. That is to say, Chinese medicine practitioner, must get higher education in TCM filed, while, Chinese medicine therapist and acupuncturist. only need to get certification from qualified training institutions, and the above positions only require certification without examination. Although Macao health bureau has put forward the draft of registration including registration system of Chinese medicine practitioner, it is still in the initial stage and not legalized.

2.7 Education and Research.

Missionaries opened the St. Paul's College, which was the earliest institution in Macao that has developed an interest in TCM and provided TCM pharmaceutical services. The pharmacy of the college imported herbal medicine from Guangdong province. The priest also wrote books related to TCM, and also made simple medicines with herb, which lead to the local Portuguese in Macao began to accept traditional Chinese medicine because of its obvious efficacy. Modern education of TCM began in the late 1950s after the founding of people's Republic of China, although Macao was unable to establish its own academic institution of TCM, the diploma of TCM offered by Guangzhou college of traditional Chinese medicine was still recognized by the government. Since then, TCM in Macao has made rapid progress among the education and academy field. Generally speaking, the status and scientific connotation of TCM in Macao is needy to be improved.

- Since the return of Macao in 1999, TCM education in Macao has gradually become standardized and specialized. In 2000, Macau university of science and technology established the school of TCM. Subsequently, in 2002, university of Macau also set up the institute of traditional Chinese medicine to foster postgraduate students. These universities cultivate TCM professionals and cooperate with mainland hospitals in clinical training to create comprehensive abilities with emphasis on both theory and practice skill. In addition, Macao education system attaches equal importance to both Chinese and western, therefore medical professionals are generally proficient in Chinese, English and Portuguese. The implementation of standardized education has improved the situation of TCM in Macao and has also become mainly residential TCM practitioners.

- The Macao academia stems from western developed countries, and the medical science is interlinked with the international mainstream, so that the research results of TCM are more likely to be recognized internationally. In 2011, state key laboratory of quality research in Chinese medicine (jointly established by Macau university of science and technology and university of Macau) was set up, which has published thousands of research papers in world-renowned journals and obtained dozens of patents, including 22 international patents. In addition, SAR government has launched a science and technology development funding. In 2017, the institution applied for 33 projects related to TCM, and 7 projects were approved, with a total of 12,746,200 mop, but there has been no individual application.

2.8 Social Organizations.

TCM associations in Macau were spontaneously composed of residents in order to revitalize TCM development. From a historical perspective, the improvement of TCM industry in Macao was almost completely promoted by Chinese people, which made TCM was recognized in Macao society where western medicine is the mainstream [4]. At present, the social organizations of TCM in Macao

include the Macao Chinese Medicine Practitioners Association, Macao Association of Chinese Medicine and AFMCM. play an important role in TMC progression.

3. Suggestion and Strategy

The study has been mentioned the development situation of Macao TCM in a recent decade. Then, the current study provided the following strategies for TCM scientific and technological industry in Macao using SWOT analysis method by analyzing the internal advantages, disadvantages and external opportunities and challenges.

3.1 SO Strategy.

Emphasis on TCM combined with cutting-edge technology is the key of the Macao TCM industry in the future. Moreover, integrating decent medical clinic resources to develop TCM health tourism projects with the mainland is a new way to get profit. Expanding market space and communicating with Portugal counties rely on the platform of the Guangdong-Hong Kong-Macao Greater Bay Area and "One Belt and One Road Initiative". Therefore, Macao TCM industry will be more likely to cooperate with different countries.

3.2 WO Strategy.

Taking advantage of geographical and linguistic priority develops TCM education products. Integrating with mainland resources, TCM trade and TCM theme tourism can be regarded as a new way to internationalize TCM education and enhance the reputation of TCM. Additionally, Macao TCM can rely on Internet+ technology to improve own medical service. On the other hand, Macao education system which combines Chinese, western and Portuguese resources can cultivate a large number of unique talents.

3.3 Strategy.

Since the establishment of the state key laboratory of quality research in Chinese medicine, scientific and technological achievements in TCM have been increasing obviously. This platform has helped enhance the core competitiveness of Macao TCM science and technology industry. In addition, SAR government has increased its investment in TCM field. These trends are all able to accelerate the transformation of research achievements, which can bring benefit to human beings as soon as possible.

3.4 WT Strategy.

There is no GMP standard in Macao. Relying on the TCM scientific and technological industrial park that cooperated with Guangdong, Macao could improve its service quality and scale of TCM industry. And above all, the legislation on TCM in Macao has not been strictly regulated, which should start from paying more attention to all kinds of problems, such as the registration system of practitioners and the quality standards of TCM product. Australia is the first western country to put Chinese medicine into law, which Macao can refer to their legislative experience.

4. Conclusion

According to the analysis results of medical statistics in recent decade, the development of TCM scientific and technological industry in Macao shows a positive and stable growth, however, it is still at an initial stage. In the future, Macao should optimize its TCM service level and try to establish potential cooperation with other communities. Macao with unique geographical and linguistic priorities should integrate the resources of the surrounding elements to improve TCM development.

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