

SWOT Framework of Academic Traditional Iranian Pharmacy (TIP)

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Abstract

Traditional Iranian Pharmacy (TIP) is a rarity that has not been introduced to the world. In fact, this branch of pharmacy can benefit Iranians and all people right across the world. It is a new field in Iran, on which a lot of research has not been done yet. In other words, this field suffers from scarcity of research. This paper tries to analyze the current situation of TIP in Iran by using the SWOT framework, so as to come up with strengths, weaknesses, opportunities, and threats which are associated with this field at the moment. It is believed that this new field has a lot of potentials which can be beneficial to the health care system substantially. Moreover, it can help the economy to a great extent if the schemes and strategies presented by TIP are taken into consideration.

Keywords: Complementary and Alternative Medicine, SWOT, Traditional Iranian Pharmacy.

1. Introduction

Traditional Iranian Pharmacy (TIP) came along in three universities of Iran in 2008, and now it is being practiced in eight universities of medical sciences (Tehran, Shiraz, Shahid Beheshti, Tabriz, Mashhad, Shahed, Kerman, and Ahwaz). This academic field can be selected by graduated pharmacy students (Pharm.D) from 13 Ph.D. majors, and its curriculum consists of these main topics: an introduction to Traditional Iranian Medicine (TIM) and pharmacy, ancient Persian and Arabic medical manuscripts, phytotherapy, quality control of traditional medications, preservation of health, an introduction to complementary and alternative medicine, ancient dosage forms and compounding, materia medica, instruments and preparation techniques, history of medicine and pharmacy in Iran and Islam, and internship in herbal pharmaceutical companies (1). Despite minor differences in university strategies, dissertations of Ph.D. candidates

should cover development and modernization of an ancient formulation and its assessment through a registered clinical trial. According to a member of TIM board committee, the higher educational system has targeted to train 500 Ph.D. candidates of TIP and TIM and recruit 100 of them as faculty members (2).

2. Significance and Objectives

TIP academic field is less than one decade old, and it is vital that the effects of this recent change be precisely and regularly monitored. It is believed that like other traditional systems, TIP has a great potential to support and improve the health care system, especially in countries with rich sources of ethnic and medicinal knowledge and a preconception about natural healing power. Therefore, it can produce job opportunities and play a prominent role in economy improvement. This article deals with four aspects (strength, weakness, opportunity, and threat) of TIP as a new potential of economic change.

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3. SWOT analysis

A SWOT analysis, which is sometimes called a SWOT matrix, is a highly structured approach so as to come up with a plan for any business activity which involves decision making and evaluating factors which can affect the overall performance of that business. A SWOT analysis is enormously useful because it can show the way for further improvement and development by taking into account both internal and external factors which can hugely impact our business venture in both the present time and future. Regarding the origin of SWOT, it is believed that Albert Humphrey, who led a group in Stanford University, created this concept (3). However, Humphrey himself has not approved of this. Therefore, the origins of this practically useful matrix have remained obscure so far. A SWOT analysis consists of analyzing four crucial elements as follows:

Strengths: These are some positive factors which a company, person, or industry has that give that entity a positive advantage over their rivals or opponents.

Weaknesses: These are some negative factors that place that business, person, or industry at a disadvantage with respect to their competitors.

Opportunities: These are some elements that businesses can make use of in order to help themselves improve and develop in their specific field.

Threats: These are some elements existing around that business which can create some problems for that business and impede their progress (4).

3.1. Review of Literature

It is not possible to find a lot of research on the issue of TIP, and this field of study suffers from a dearth of research that can introduce this branch of knowledge to the world. Thus, some of the research done in other countries that is related to their pharmaceutical industries will be presented here. In fact, what is presented here is related to using the SWOT framework. Meem Rafiul Hoq *et al.* did a piece of research on the current state of the pharmaceutical industry in Bangladesh, and they came up with some strengths and opportunities versus some weaknesses and threats. They concluded that the opportunities and strengths should be used

properly in order to help Bangladesh increase its foreign trade as well as its Gross domestic product (GDP). Also, they believed that the threats and weaknesses should be managed so well that they cannot affect their pharmaceutical industry or at least affect their industry to a lesser extent (5). Ying Liu *et al.* analyzed the international competitiveness of Traditional Chinese Medicine (TCM) using the SWOT matrix. They investigated four factors (opportunities, strengths, weaknesses, and threats) which can affect the international competitiveness of TCM both positively and negatively. In their research, they found that there are a variety of complex factors that might affect the international competitiveness of TCM in the world. However, they made sure that TCM would enter the market and be able to compete with western medications. They believed that after many years of using such drugs, people have come to appreciate their effects and usefulness (6). In another study, Mahdei carried out a SWOT analysis of medicinal plants and their production situations in Iran. The researcher used both documentary and survey studies in order to come up with a systematic approach to analyze the production situation of medicinal plants in Iran at that time. The results were presented in a SWOT framework that contained both internal (strengths and weaknesses) and external (opportunities and threats) factors (7).

4. SWOT Framework of TIP

4.1. Strengths

SI. A wealth of written records

Iranian medical manuscripts in reference libraries and national museums are one of the main sources of TIP research. In ancient Persia, a proficient physician had to be trained not only in different aspects of medicine, but also in botany, zoology, mineralogy, jurisprudence, and astronomy. Thus, medical knowledge encompassed a wide domain of sciences. Nowadays, countless ancient Persian manuscripts written in these different fields are kept in reference libraries, both in Iran and overseas (8). It is essential to notice that the scientific language in medieval Persia was Arabic. Hence, to have more impact on the scientific world, most of the Iranian scholars of that era, including Rhazes and Avicenna, tended to write their works

in Arabic (9). That is why such library catalogues are teemed with Arabic titles by Iranian scientists. These days in Iran, all traditional pharmacists and practitioners have access to numerous medicine manuscripts easily. While these books belong to a wide timespan (about 1300 years), frequency of one specific medical treatment in consecutive books is a sign of value and reliability. Considering these authors' and scholars' biography highlights their talent and hard efforts in knowledge areas. Furthermore, it is believed that unsuccessful treatment approaches or medical faults were eliminated or discontinued during centuries and only resulting therapeutic methods have been repeated in such books.

S2. People's needs and beliefs

In recent decades, Complementary and Alternative Medicine (CAM) has got many followers in developed countries, while Traditional Medicine (TM) is more common in Africa, South Asia, Latin America, and Western Pacific region. The demand for these methods is also increasing in Iran; for instance, most patients in the country strongly believe in CAM at the late stages of chronic diseases (10). Based on one recent systemic review, which included 51 reports from 49 surveys in 15 countries, in economically disadvantaged countries, dependence on traditional practitioners is more widespread, even for serious illnesses. On the other hand, people of wealthy societies who have access to high quality healthcare systems, use an excessive amount of CAM for health promotion and prevention purposes (11). Generally, the standardized products of domestic phytopharmaceutical companies are widely welcomed by both physicians and patients in our country, and TIP can intensively benefit from this public acceptance.

S3. A sturdy bridge towards modern pharmacy

Modern pharmacy and medicine has hugely gained benefit from both natural products and TM systems since 1805, when morphine, the first pharmacologically-active compound, was isolated and introduced to the world. Besides abundant clinical experiences of traditional therapeutic systems and unique diversity of biologically-active chemicals, other advantages have been brought

to the developmental process of new drugs. One of them is "synergism", i.e. greater effect of multiple components rather than sum of the individual drugs. When "1 disease, 1 target, 1 drug" is inefficient for the treatment of complex diseases, like diabetes and cardiovascular diseases, a "multi-drug and multi-target" approach based on traditional mechanisms is the advisable choice. Network pharmacology and big data are vastly used to explain the synergism (12). TCM, as a strong pioneer in modernization, has had a great role in drug discoveries. One of the basic theories behind TCM multi-constituent is defining four main roles for a single herb in compounding. The *Jun* (emperor) targets the major symptoms of a disease. The *Chen* (minister) has a synergistic effect with *Jun* to strengthen the therapeutic effects or treat secondary symptoms. The *Zuo* (assistant) eliminates or reduces probable adverse effects, and the *Shi* (courier) eases delivery of main components to the action sites (13). More or less similar corresponding terms (Asl & Amod, Mofatteh, Mosleh, Mobadriq) for single components exist in TIP, and converting them into updated definitions is one of the urgent research domains of this field.

S4. A practical assistant to conventional medicine

There is a raft of effective therapeutic approaches in TIM to cure various illnesses, such as peptic ulcer, gastritis, irritable bowel syndrome, headaches, Alzheimer's disease, and primary dysmenorrhea (14-18). As many research projects and clinical trials are concentrated on making evidence for TIP, there is a great hope for introducing a variety of natural medications in the near future. Newly-released therapeutics will cover some limitations of conventional prescriptions and offer new and safe treatment options.

S5. Focusing on a six-principle lifestyle rather than multi-components:

Based on the basics of TIM, the first and most important step of having a healthy body is following a correct lifestyle. This basic contains six essential principles: (a) air and weather (b) food and drinks (c) sleep and awakening (d) physical movements (e) mental or psychical changes (f) retention and excretion (19, 20). For each disorder

der described in TIM, the most suitable lifestyle has been presented. It is strictly suggested that any disease be cured firstly by foods and then single drugs. If not responded, there is time to use compounds (21). This approach which minimizes the occurrence of multi-component adverse effects is one of the strong rules and fortes of TIP.

S6. Wide range of price and variety

Ancient manuscripts have introduced a wide variety of approaches and medications for each disorder. Being produced from natural sources, the therapeutics did not have a uniform geographical distribution in the past. For instance, one of the main materia medica books has suggested at least 45 herbs and 15 minerals for burnt wound healing (22, 23). Hence, a comprehensive text had to offer a wide range of natural remedies to facilitate drug production. Today, easy access to natural products world-wide has added a great benefit to TIP, and no more is there any shortage of raw materials, even in different seasons. So, drug development based on rich written works enables pharmacists to produce efficient drugs of any rates.

S7. Distinct methods for raw material processing

In traditional manuscripts, there are some chapters in which specified methods for processing of herbals and minerals are clearly described. Burning of shells, washing the powdered therapeutical soils or edible oils, and roasting the seeds are some examples of these processes (24, 25). It is essential to know how and when they should be performed. Although further practices and experiments are needed to precisely define the philosophy behind these methods, some of them have definite reasons; for instance, taklis (long burning with overheat in oven) is used for the ease of grinding to produce fine and highly permeable particles.

S8. Natural resources access:

Because of distinct climates and four ecological zones existing in Iran, the region benefits a high biodiversity. Iranian habitat supports nearly 8000 species of flowering plants (167 families and 1200 genera), among which 1700 are endemic. Dominant trees and medicinal herbs in four zones are as follows: *Juniperus sabina*, *Pistacia vera*,

and *Acer* spp. in Alborz range forest steppe, *Pegatum harmala* and *Artemisia* spp. in Caspian lowland desert, *Salvia*, and *Astragalus* spp. in Zagross zone and *Taxus baccata*, *Quercus castanefolia*, *Punica granatum* in Hyrcanian forests (26). In order to produce traditional medications, the majority of raw materials are easily accessible in local markets.

S9. Developing new nutraceuticals

The combination of traditional data and natural products is a rich source for developing new nutraceuticals. The international market has welcomed many of such formulations based on ethnopharmacological claims and traditional-based ideas. Healthy diets consist of health-promoting foods and drinks, including protein supplements, energy drinks, sport drinks, nutrition fortified foods, and herbal formulations (27). Many factors have led to high demands and interests of public in nutraceuticals and functional foods. Recent health trends, like a rise in aging, an increase of life expectancy, high prevalence of obesity, heart diseases, cancers, osteoporosis, and arthritis have made people, who are more nutrition-savvy and educated than before, seek healthier foods (28). Like other traditional systems, TIP has offered numerous nutraceutical formulations having potentials of production and industrializing.

S10. Benefits of a multidisciplinary field

TIP is considered a multidisciplinary major per se, which has strong links with various fields, such as philosophy, chemistry, different areas of medicine and pharmacy, literature, history, botany, bioinformatics, and many others. Practicing TIP has mutual benefits, both for its improvement and also for the introduction of new challenges which can be solved using concepts of other fields.

4.2. Weaknesses

W1. Insufficient related industries and laboratories

Running phytopharmaceutical industries needs a vast number of requirements and technologies. Strong links between related industries are needed. Providing raw materials with accepted quality, hygienic packaging, storing the products in

healthy conditions, and disposing high amounts of natural waste are some essential steps to plan for. Final products have to be approved in quality control laboratories according to the international protocols, including physical, microscopic, chemical, and biological evaluations, purity determination, quantitative analysis, authentication and reproducibility of herbal ingredients check, adulteration, substitution, and purity control, good agricultural/manufacturing practices, contaminant control of herbal ingredients, and final standardization (29). Many of these steps still have not been worked on seriously, and there is a far way to industrialize traditional phytopharmaceutical.

W2. Gap in federal rules and governmental support

Today, a majority of natural medications are not under insurance coverage. Since 2014, only 56 herbal products have been accepted by insurance companies (30). Being unaware of this list, physicians do not tend to prescribe them; otherwise, there is no substitute for their choices.

W3. Accurate equivalents for ancient words

TIP manuscripts belong to a panoramic area, from Andalusia to India and an era more than a millennium. Therefore, the remaining texts, both in Arabic and Persian, contain numerous words and common names for materia medica and diseases. Although TIP students are taught how to find these equivalents, some cases get more challenging. It is vital to consider that translation of ancient data to the current scientific language is of great importance because after correspondence, there will be no link between readers and the original texts. So, the publication of recent invalid texts that guide the users and practitioners wrongly should be strictly prohibited.

W4. No cure for recent-emerged diseases

There are no exact equivalents for recently-emerged diseases, like multiple sclerosis or polycystic ovary in ancient medical manuscripts. The mere innovative method for finding the treatment protocol is practicing on similar signs and symptoms common between them and other illnesses mentioned in such manuscripts. This task is

easier to perform with the cooperation of experts from traditional and conventional systems.

W5. Lack of trained human resources

Because of the newness of this field, the number of skillful trainees is not enough to cover the next generations of producers, trainers, health consultants, practitioners, and manuscript translators. Adding related courses to university curriculum for undergraduates and holding workshops for graduates are two practical approaches.

W6. Increased price

High-tech methods for developing phytopharmaceuticals are costly, so modernized products will be more expensive than simple traditionally-made drugs. It should be considered whether physicians would prescribe modernized phytopharmaceuticals for price-conscious patients or not.

W7. Profound missing data

Today, a large number of patients refer to TM specialists and get their prescription from traditional pharmacists. It seems that high task loads prevent them from precise documentation, so a lot of valuable data about effects or adverse effects of medications are missing. It is advisable to prioritize the tasks and set an organized documentation system for saving such useful data.

W8. Boldness in prescription

If interim satisfaction of patients were aimed at by traditional practitioners, this strategy might harm patients' health. Although many medications relieve sooner, they have adverse or toxic effects which mostly appear after a long period of time following their consumption. Unawareness of adverse effects and inaccurate prescription result in defaming the whole concept of TIP.

W9. Placebo effect

There are strong beliefs regarding the relationship between the supernatural and the healing power among people. Some traditional practitioners use patients' strong beliefs in the process of the treatment. Despite the existing controversy on this issue, the impacts of using this method cannot

be generalized and might be considered as a placebo effect.

W10. Mistakes because of lack of knowledge

Besides TIM practices, people tend to follow other systems of treatment, i.e. folk medicine. Having strong points, it cannot cover the scientific basis in some issues and has even led to health risks. Such mistakes may defame the evidence-based TIM and TIP. Medicinal herbs like *Atropa belladonna*, *Aconitum* spp. and *Digitalis* spp. can be poisonous even in therapeutic doses. Also, the cases of hepatotoxicity due to pyrrolizidine-alkaloid containing plants, such as Comfrey, are examples of common side effects of medicinal herbs. So, lack of knowledge can adversely affect patients' health (31).

4.3. Opportunities

01. Wide product range

Because of targeting niche markets, the future perspective of TIP, as a new academic field, appears promising. In addition to producing modernized phytopharmaceuticals, nutraceuticals, and cosmeceutical with a large added value, preparing cultural and science-based products, including software packages, databanks, applications, TV programs, journals, and general or professional books is possible, so investment in such projects after market research can lead to financial benefit and improvement of the region economy.

02. Distinguished role in health improvement

The basis of TIP and TIM is keeping the body healthy and balanced, rather than curing the illnesses (32). Hence, teaching and practicing such healthcare methods will decrease the burden on society. According to what has been mentioned in ancient health approach texts, each person has to follow special rules in order to maintain their balance. These rules are defined based on personal traits like temperaments, age, and habits, besides environmental conditions, such as seasons and geographical area. Implementation of such rules is supposed to have an important role in prevention of diseases, especially the chronic ones. This preventive approach can also be introduced worldwide.

03. Intellectual properties (IP)

Now a rich source of TIP manuscripts full of mono- or poly-component formulations is available for scientists (33). Besides having this knowledge in hand, recent technological improvement of pharmaceutical sciences has made the condition of drug discoveries easier. It is no more needed to screen a wide range of active components to reach an efficient natural medication because ancient manuscripts are considered a valuable source for the decision making process of researchers of this domain. While this method is both cost-beneficial and time-saving, most countries with a strong background in traditional medicine, like China and India, are making hard efforts to develop new medicines based on their ancient knowledge. TIP research groups can move toward patenting evidence-based traditional formulations and use related financial incentives. Patents, one type of the intellectual properties, are intangible assets of a business, and IP-intensive industries are believed to generate more than 70% value added per employee than non-IP-intensive industries (34).

04. Governmental supports

Since 2012, science-based Iranian companies have been intensively encouraged by the government to manufacture products that are the result of university research projects. To make industry and university closer, the government has been supporting mid-tech and high-tech small businesses by giving them tax incentives or providing many facilities, including free workshops, financial helps for international patenting, and low-interest loans. Pharmaceutical industries are of highest priorities of the government (35).

05. Training-related businesses

Training of TIP in all levels is needed and welcomed. Many people are interested in recognizing their temperaments and the most suitable lifestyle and diet according to TIM and TIP fundamentals. It is highly valued if general physicians and specialists take into account the interactions between herbal medicine and chemical drugs to avoid some unwanted effects. Industrialists of herbal medicine are seeking reliable ancient data for developing new drugs. Moreover, trained bo-

tanicals are required in laboratories or institutes for professional services. In addition, there are numerous potential training opportunities for target groups, such as overseas academics, school students, and herbal shopkeepers to get acquainted with TIP scientific basics. All of the above ideas offer multi-level training-related businesses.

O6. Job opportunities / Improvement of entrepreneurship

One of the most challenging concerns, especially among young people in the world, is unemployment. To solve this problem, nations are highly investing on improvement of entrepreneurship (36). Leading to regional economic development through new ventures and job creation, entrepreneurship in Iran has attracted large attention in recent years (37). A multi-disciplinary and productive major like TIP is extensively linked to services, and production is anticipated to have a great role in entrepreneurship. This area desperately needs to hire qualified workforce in agriculture, raw material processing, phytopharmaceutical companies, quality control, and sales and marketing.

O7. Tourism industry

Health tourism market is one of the worldwide competitive industries and is considered one type of advanced tourism. Internationally, most countries are interested in taking advantage of financial rewards from this industry. Different nations, especially developing Asian countries, are highly investing in this sector (38). Favorite weather, four-seasoned nature, historical, religious, natural, and cultural tourist attractions have made Iran a favorite destination for overseas visitors. As TIP and TIM are unique heritage of ancient Persia, they can be introduced worldwide and be attractive to a wide range of audience. Traditional health services, such as defining the temperament, giving advice about suitable diets and lifestyle, and introducing native herbal medicine can be presented as new attractions.

O8. Supply chain improvement

A network created amongst different steps of production, handling, and distribution of a spe-

cific product and getting a product or service from the supplier to customer is supply chain. Having the most optimized supply chain leads to lower costs and better services. Hence, supply chain management (SCM), which is the integration of information and material flows increases the success in competitive trade (39).

O9. Cooperation with the humanities

Working and researching on medical Persian and Arabic ancient manuscripts is one of the practical methods for extracting the required information. In this process, rewriting and reviving ancient books, as an important task of TIP students or graduates, leads to accessing new data about the history of pharmacy and medicine, literature, philosophy, alchemy, and medical ethics, each of which can be used as a research subject. For instance, the study of *Masalih Al Abdan wa al-Anfus*, a treatise from Al-Balkhi, an Iranian encyclopedic scholar (849-934 AD) at the Islamic Golden Era, has revealed the precedence of his innovative definition about obsession and its differentiations from melancholia (40). Moreover, unlike other scholars, he had proposed behavioral management for phobias quite similar to contemporary therapies (41).

O10. Multi-center projects

Because of the multi-disciplinary nature of TIP, there are numerous opportunities for forming collaborative project teams and benefiting from the valuable outcomes of strong cooperations. Multi-center collaborations are considered as an important strategy to encourage the coordination of the staff that are involved in healthcare practice, service, and research. Some of the positive outcomes are using the resources efficiently, improving the services, sharing the responsibilities, and reducing the pressure caused by increasing demand (42).

4.4. Threats

T1. Disappearance of folk knowledge

Sixty-two widespread plant families with a broader range of ecological information are used in local medicine (43). The basis of ethnopharmacological knowledge is the local use of natural medicines including plants, animals, fungi, microorganisms, and minerals by human cultures. This

science has an important role in sustaining local health care practices, especially in cases of chronic and infectious diseases (44). Although parts of such data cannot be now interpreted by recent findings, this should not lead to their quick omission. Further research may confirm their effects.

T2. Distinction of some jobs

In case of academic TIP developments, there is the possibility of some related jobs being faded like local herbalists and medicinal plant retailers. While the official health system of the country is supported by universities, producing evidence-based scientific data may cause underestimation of unwritten experiences of herbal practitioners or herbal store owners. Saving these jobs leads indirectly to protecting ethnic information.

T3. Potential health risks

In cases of malpractice, the credit of TIP may unintentionally be hurt. Prescribing adulterated and potentially toxic plants, using natural product polluted with pesticides, insecticides, parasites, heavy metals, or microorganisms, which have undesired consequences, can easily defame the scientific methods of drug development and treatment. A wide range of adverse effects from mild effects (allergic reactions, nausea, and gastrointestinal upset) to moderate effects (confusion, leucopenia, and convulsions) to severe effects (perinatal stroke, lead or mercury poisoning, coma, and death) have been reported because of adulterations or contaminations (45, 46). Aflatoxins which occur mostly in grains and herbs in humid conditions are highly toxic. These metabolites with carcinogenic, teratogenic, and mutagenic properties were detected in more than 40% of botanicals (47).

T4. Less basic research

Because of high expenses needed for basic research, including genomics, proteomics, metabolomics, and transcriptomics, insufficiency of TIP research grants may prevent academics from entering this area rather being involved in drug production, which has greater value added. However, in the long run, this trend will appear disadvantageous because sciences can remain alive based on their strengths of basics, roots, and phi-

losophy. Newer techniques such as omics give us deep knowledge about pharmacodynamics, pharmacokinetics, toxicological characterization, and standardization of herbal active constituents (48). With the expansion of TCM in western countries, an increasing demand is seen for using omics techniques and bioinformatics (49, 50). Pharmacodynamics, pharmacokinetics, and efficacy tests of multi-component TCM drugs have been always challenging; however, applying omics techniques has paved the ways toward many breakthroughs (51).

T5. Conversion to false data

While there are high demands for rewritten versions of ancient handbooks, some publishers tend to hire unskilled, but fast people for this task. However, sometimes reading the manuscripts with illegible handwriting makes the task difficult, and getting help from skillful people is needed; otherwise, false words may be chosen, and the efficiency of formulations will be completely changed. Therefore, it is strongly advisable this task be performed just by skillful people who are familiar with the terminology of TIP, and also they should have access to different versions of each manuscript to compare and ensure the correct conversion.

T6. Problems with raw material sources

There are numerous obstacles in growing medicinal plants. Unpredicted weather conditions, lack of rainfall, limited access to high quality seeds or cuttings have caused farmers' low tendency to grow medicinal plants. They allocate their farms to medicinal herbs just in case of selling them in advance. Moreover, agricultural industry brings more benefits for finished product makers, then raw material wholesalers, and less for farmers. High load of bioburden is another problem. In non-automated systems, humidity causes rapid infection growth and spoilage after collecting the medicinal plants. Even minor amounts of infection will result in final product rejection. Moreover, some potential dangers with natural products have extended conservation trends for the collection of different plant parts, emphasizing sustainable harvesting (52). Identification and authentication of

medicinal herbs are other challenges, which can be overcome by novel techniques like DNA barcoding (53).

T7. Inappropriate supervision

Because of the newness of TIP as an academic field, there are still insufficient rules and legislations related to TIP products, and it is considered as a limitation for both authorities and producers. This gap, which leads to inappropriate supervision, is a source of abusing. Usage of uncontrolled or hand-made medicine by local herbalists will harm the health of consumers and patients. It is wise to move toward the worldwide mainstream and actively join international decision-making associations and use other countries' valuable experiences. Because of the increasing number of traditional medicine products in western countries, new legislations covering both nutraceuticals and herbal medicine are recently in force (54). European Union Pharmaceutical legislation contains detailed quality requirements for such products. A system of manufacturing authorizations ensures that production and importation of all herbal medicinal products in the European market are performed only by authorized manufacturers in accordance with the GMP adopted by community (55). Another admirable effort for establishment of a harmonized market in the EU has been the preparation of herbal monographs for most European herbal substances and other accepted evaluation criteria (56).

T8. Water crisis

Water is one of the most important elements in human life. In fact, there is no denying that life is unimaginable without water. Water resources in the world are used for lots of purposes, one of which is agriculture and planting herbs. Research has shown that up to 70 % of the water we take from rivers and groundwater goes into irrigation (57), which means that planting herbs can hugely affect water resources in the world. Also it has been shown that US potatoes require soil moisture levels of 25% to 50%; alfalfa, 30% to 50%; and corn, 50% to 70% (58).

T9. Environmental changes

Climate change has hugely impacted growing special herbs. This issue has raised concerns regarding the future of such herbal medicine. Dr. Lagoudakis stated that imminent changes in the environment are a threat to traditional medicine. In fact, it is believed that TM uses some plants in order to make natural remedies to treat sicknesses, but this alternative medicine has been affected by climate changes and human interventions in the nature (59). All in all, it seems that the consequences of environmental changes on TM have not been completely understood, and more research is necessary in this area.

T10. Energy consumption

Energy consumption is one of the most debatable issues when it comes to planting herbs. In fact, plants consume energy both directly and indirectly. According to Beckman, a lot of fuel is needed to run machinery on the farm for planting, tiling, and harvesting. Moreover, the fertilizer that is used to grow plants needs a lot of energy to be manufactured. Such energy consumptions can cause a lot of pollution and release a lot of hazardous gases (60).

5. Conclusion

TIP is a new field with a lot of potentials, which can help the health care system by being used directly or by supplementing conventional medicine. In order to have this effect on the health care system, this field has to be investigated both scientifically and empirically with a lot of care. It is evident that careful investigation of a phenomenon hinges upon knowing and being familiar with its strengths, weaknesses, opportunities, and threats. By considering these four elements with respect to TIP, experts all around the world come to understand that this field has tremendous and limitless potentials, which can enable physicians to choose from a wide range of pharmaceutical products. Also, it is necessary to take weaknesses into account and try to identify and address them carefully. Another point is that TIP has created a window of opportunities for us. In fact, making use of such practices and available opportunities can enable the country to solve problems much

more easily. On the other hand, the threats associated with such practices must not be neglected. By considering possible threats, it is hoped that they can be eliminated or at least reduced so that such

useful practices do not cause any problems either for people or the environment.

Conflict of Interest

None declared.

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