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Featured Topic: Apple Pectin

Effect of ProPectin on Patients with Elevated Cholesterol Levels: A Clinical Pilot Study

R. Dimitrova, Chemical Engineer, Research Associate,
Bulgarian Academy of Sciences
and Z. Velichkova, Biologist

Dr. Michael Nobel Asia Forum: Escalating Global Pollution and Family Health Concerns

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A Word from the Editor in Chief

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Dear Readers,

Welcome to the latest issue of AHCJ.

The Asia Regulatory Professional Association (ARPA) has been collecting a lot of amazing articles, which are contributed by various experts in healthcare field. We aim to convey the most updated healthcare news to the public by our journal.

First of all, I would like to introduce ARPA's new working partner, RiseBeyond. For the coming future, ARPA is going to collaborate with RiseBeyond in different projects. RiseBeyond is a corporation with full of social responsibility. It facilitates the disabilities to integrate into community. For this time, RiseBeyond also provides a thought provoking article to us. It tells us how handicapped people can serve our healthcare system.

Under the regulation enforced by the Department of Health, all healthcare products must be registered and approved by the department before they are lanuched onto the market. In this case, the RiseBeyond gathered many handicapped individuals to provide this kind of registration service. RiseBeyond not only educate the disabilities about regulatory affairs, but also secure their incomes. They have been already started seven projects. It is definitely an inspiry performance! They proved how strong disabled people can be! Everybody please stay tuned and look what other achievements is coming!

Hope you all enjoy the articles.

Prof. Jack Wong
Asia Regulatory Professional Association

ARPA
Asia Regulatory Professional Association

The Asia Regulatory Professional Association (ARPA) is an organization of healthcare regulatory affairs professionals in Asia. ARPA aims to raise the standard and social recognition of regulatory professionals as part of healthcare team.

Details of ARPA can be found in
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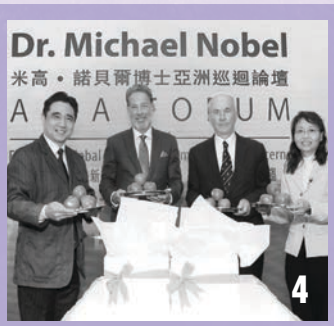

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以健康信念模式探討影響澳門女性乳房自我檢查之因素

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Health Care Staffing Solution Provider Bamboos listed in the Hong Kong Exchange Main Board

Bamboos Health Care Holdings Limited ("Bamboos" , together with its subsidiaries, the "Group"), a healthcare staffing solutions provider based in Hong Kong, has officially transferred its listing from the Growth Enterprise Market ("GEM Board") to the Main Board of The Stock Exchange of Hong Kong Limited ("SEHK") under the new stock code 2293 on 1 March 2017.

Ms. Winsome Hai, Founder and CEO of the Group, said, "Listing on the Main Board of SEHK, and transferring from the GEM Board, is a remarkable milestone for the Group. Our Group's development moves to a wider platform with more opportunities. Since our establishment, our Group has focused on developing healthcare staffing solution services, and at the same time extended our service reach to the provision of outreach case assessment related activities. Our Group's revenue and profit both achieve stable and robust growth. Our Board and the management believe that transferring to the Main Board further enhances the corporate brand strength, enhances the publicity and business prospects of our Group. With a broader financing platform, shares trading on the Main Board will increase the liquidity of our Group's shares, and thus enhances financing flexibility. We expect the transfer of listing will bring our Group with more opportunities, with the international financing platform in Hong Kong, we aim to capture more expansion potentials attract potential investors and further enhance our Group's competitive strengths comprehensively, consolidate our leading position in the healthcare staffing solution industry and bring more benefit to the society and sustainable return to all stakeholders."

Bamboos was listed on the GEM Board on 8 July 2014, the last trading day of its shares under the original stock code (8216) was 28 February, 2017; and the Group's shares starts trading under its new stock code (2293) on the Main Board of SEHK on 1 March 2017. There is no change made to the English and Chinese stock short names, the existing share certificates and the board lot size shares. The revenue of the Group is mainly generated from the gross fee received from the provision of healthcare staffing solution services, net of the cost payable to healthcare personnel placed by the Group. For the two years ended 30 June 2016 and for the 6 months ended 31 December 2016, the Group had maintained stable and robust business growth with recorded revenue of approximately HK$46.5 million, HK$51.0 million and HK$29.8 million respectively.

Ms. Winsome Hai, Founder and CEO of the Group, concluded, " Our Group will continue our effort in adhering to our core values 'Care, Competence and Commitment' , which are at the heart of who our Group is as a company, a team and a dedicated member of the community, and our Group strive for excellence at all times. The Transfer of Listing testifies our efforts, strengths and perspective in the operation of our business. Our Group will continue our effort in the provision of healthcare staffing solution services, capture opportunities for future development, consolidate our leading position in the market and further expand our market share in the industry."

About Bamboos Health Care Holdings Limited

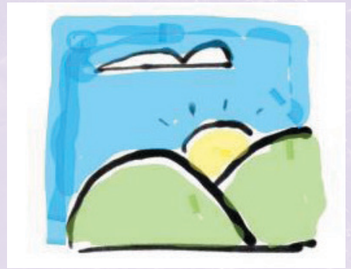
Established in 2009, Bamboos is a provider of healthcare staffing solutions in Hong Kong. The Group engages principally in the provision of customised healthcare staffing solution services on a temporary basis to individuals and institutional clients in a timely manner as well as duty opportunities to self-employed healthcare personnel registered with the Group. There are over 17,100 healthcare personnel registered under the Group, mainly provide services of: (i) private nursing staffing solutions; and (ii) institutional healthcare staffing solution to individual, hospital and social service organization clients.

Website

Introduction of ARPA's new working partner

Meaning of "RiseBeyond"

"Rise Beyond" implies that "everyone has an opportunity of elevating beyond oneselves".



Reasons behind "RiseBeyond"

In November 2015, our founder realized that people with disabilities encounter difficulties in the process of job hunting. Their physical hinders are always over-emphasized. The number of job offerings and varieties of positions are, therefore, strictly limited to them. That was the time when the concept of "RiseBeyond" started to form. Our founder started to meet people with similar ideas from that on. And, this extraordinary journey of "RiseBeyond" begun.

About us

We specialize in providing product registration service for medical devices (and pharmaceuticals in near future) in Hong Kong. We provide high quality and comprehensive registration service to our clients.

Our dreams

We aim to be the best and biggest regulatory consultant in Asia. Our consultants are well-trained and certified by the Asia Regulatory Professional Association. It is a trustworthy team.

Social responsibilities

As we believe that "everyone" has opportunity to contribute to the community, most of our team members are handicapped. We tried to provide more working opportunities to disadvantaged groups.

When "RiseBeyond" Came Into Life / The Concrete Form of "RiseBeyond"

In January 2016, "RiseBeyond" was officially registered as a formal company providing medical device registration service and adopting the ideas of social integration. By working closely with disabled persons, we truly wish to share social responsibility through employing persons with disabilities and to let actions speak that "everyone has equal opportunity to be hired and the ability to contribute to the society".

Soon after the registration, we invited relevant organizations and units to join hands with us. Through our partnerships, in the aspects of offering formal on-the-job trainings, striving for the opportunities of attending industrial exhibitions and regulatory forums and etc., we aim at better equipping our interns to be professional medical registration consultants. We also work on building a warm and close supporter-to-supporter relationship with our interns at all time, no matter at their working hours or at leisure time. We hope these warmness and closeness will become one of the most remarkable and concrete experiences in our lives and will bring new supports into the goal of integrated society.

▲Group photos with the Hong Kong Physically Handicapped and Able-Bodied Association (PHAB Association)

▲Training program for regulators provided to members of Hong Kong PHAB Association

Dr. Michael Nobel Asia Forum: Escalating Global Pollution And Family Health Concerns

(From left) The four world-renowned speakers :

- **Dr. Andrew Young**, Leading Oncologist, Advocate of Integrative Medicine, Founder and Department Head of the New Life Cancer Center, Taoyuan General Hospital
- **Mr. Yank Barry**, Three-time Nobel Peace Prize Nominee
- **Dr. Michael Nobel**, Chairman of Nobel Sustainable Trust Foundation
- **Dr. Mamie Lau**, Ecotoxicology Expert, Founder and Director of RadHealth

Hong Kong Health Care Federation and ProPectin jointly organized the "Dr. Michael Nobel Asia Forum" in October, 2016. The forum aims to share the latest situation of global pollution on human health, trend on Integrative Medicine Development and new Healthcare discoveries in Asia and to raise public awareness of disease prevention. Dr. Michael Nobel, as the main speaker of the forum, presented expert insights on how radionuclides and heavy metals affect our daily life and suggest the way to protect our family. By exploring the threats brought by contamination and the latest medical discoveries, the audience was able to collect up-to-date information for taking effective precautions against particular illnesses.

The lecture tour organized in three key financial cities - Hong Kong, Guangzhou and Shanghai with more than 700 attendees including medical professionals, medical regulators, government officials and media.

▲ Distinguished speakers and honorable guests were proposing a toast at the beginning of the event

▲ Dr. Margaret Chung, Founder and Honorary Chairman of the Regeneration Society

▲ Ms. Winsome Hai, CEO of Bamboos Professional Nursing Services Limited and Mr. Ching-fung Chow, President of The Hong Kong Society of Chinese Medicines and Dr. Andrew Young

▲ Dr. Mamie Lau explained about the nuclear catastrophe at Fukushima in 2011

Dr. Mamie Lau showed how ocean currents, after the nuclear catastrophe at Fukushima in 2011, transported radioactive substances to North America and back to Asia. She demonstrated the radiation levels measured in Hong Kong doubled that of Tokyo, explaining this is attributed to construction and renovation materials which contain radioactive granites that emit radon. Her testing also discovered toxic metals in seafood, sashimi and even organic produce.

Dr. Andrew Young stated that there was 30-35% of cancer cases are triggered by an unhealthy eating habit. Diet can also directly affect cancer risk. Some foods, such as processed and red meat and salt-preserved foods, can increase the risk of developing cancer. While others, such as foods high in soluble fibre, can reduce the risk of cancer.

Mr. Yank Barry shared his personal experience in fighting diabetes. He stated that the blood glucose and insulin levels had significantly dropped after taking apple pectin for four weeks. The pectin is capable of decelerating the absorption of glucose and assist in weight management.

At last, Dr. Michael Nobel stated that Apple pectin contains high concentrated D-Galacturonic acid which can be easily assimilated and help in expelling hazardous heavy metals out of our body.

Exposures to environmental pollution remain a major source of health risk throughout the world, it is time to identify potential risks to our health before it is too late.

▲ Dr. Nobel stated that we were living in a contaminated world

▲ (From Left) Dr. Andrew Young, Dr. Michael Nobel, Mr. Yank Barry and Dr. Mamie Lau, released their medical discoveries

▲ Forum in Hong Kong

▲ Forum in Guangzhou

▲ Forum in Shanghai

Prof. Robert Kam Ming Ko
Hong Kong University of Science and Technology. After graduating from the Chinese University of Hong Kong, he went on to Canada and obtained his Ph.D. in pharmacology at the University of British Columbia in 1990. Since then Prof. Ko returned to Hong Kong to pursue his research work on Chinese herbal medicine. Prof. Ko researches on the antioxidant and immunomodulatory properties in Chinese tonic herbs in establishing their scientific basis in terms of modern medicine, and has so far edited three books and published more than 180 scientific papers and book chapters on related topics. Prof. Ko is also a pioneer in developing proprietary Chinese herb-based health products and skincare products in Hong Kong.

Research expertise: Antioxidant mechanism(s) of Chinese tonic herbs with focus on the regulation of cellular glutathione redox status; Pharmacological basis of Yang/Qi-invigoration in Chinese medicine

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Dr. Pou Kuan Leong
Dr. Pou Kuan Leong is a post-doctoral fellow in Prof. Ko's laboratory in the Division of Life Science of the Hong Kong University of Science and Technology (HKUST). He received his BSc and PhD degree from HKUST in 2007 and 2012, respectively. His research focuses on the antioxidant effects afforded by various phytochemicals, in particular the active ingredient isolated from Chinese Tonic herbs, and the underlying mechanism of the anti-inflammatory activity afforded by various phytochemicals.

Dr. Jihang Chen
Dr. Jihang Chen received his master degree from Guangzhou University of Chinese Medicine, China in 2010. He completed his doctorate studies in Biochemistry in the Division of Life Science of the Hong Kong University of Science and Technology in 2014, under supervision of Prof. Ko. Currently, he is a post-doctoral fellow in Prof. Ko's laboratory. His research focuses on the chemical and biochemical characteristics of the 'Yang-invigorating' action of Chinese Yang-tonic herbs, especially the Cynomorii Herba.

Yin Kwan Chung
Yin Kwan Chung is a junior student of the Hong Kong University of Science and Technology, major in Biochemistry and Cell Biology. Chung's research interest focus on understanding Traditional Chinese medicine and its theory by modern science. Chung has recently published a review paper on Chinese medicine in understanding the function of Spleen, a visceral organ in Traditional Chinese medicine, in Western medicinal perspective, under the supervision of Prof. Ko, Chung currently engages in analyzing the molecular differences between processed and unprocessed Rehmannia glutinosa (Sheng Di) and their relation to the differential therapeutic activities. Chung will join a research project on studying the matrix effect in Chinese medicine decoction in the Massachusetts Institute of Technology in Summer 2017.

Spleen function and anxiety in Chinese medicine: A Western medicine perspective†

†This article is a revised version of an original article published in Chinese Medicine 7: 110-123 (2016), DOI: 10.4236/cm.2016.73012

Abstract
Traditional Chinese medicine (TCM) has been practiced since ancient times in China for the prevention and/or treatment of diseases. Yet, the complete understanding of its theoretical basis in relation to clinical practice from the modern medicine perspective is still lacking. According to TCM theory, the Spleen, as one of the five Zang (i.e., visceral organs), plays an important role in various physiological functions, including digestion and absorption of nutrients, regulation of water retention and excretion, facilitation of blood perfusion to skeletal muscle and on the optimal functioning of the immune system. Clinical applications of herbal formulations for the treatment of Spleen deficiency (i.e., a decline in Spleen function) and their pharmacological activities are described. The view point of TCM on how emotions (or Qing Zhi) can influence the body function is introduced. The relationship between anxiety and Spleen function has been analyzed by reviewing relevant research studies in modern medicine. These findings suggest that the cause/consequence relationship between anxiety and Spleen function may be bi-directional.

Introduction

Traditional Chinese medicine (TCM) is a medical practice originating from ancient China through thousand years of experiential use. It still plays an important role in medical care in China and Southeast Asian countries despite the advent of Western medicine. However, the practice of TCM has become increasingly popular in western countries because of its sophisticated and successful treatments for many health conditions and even diseases that are regarded as untreatable or incurable by conventional Western medicine. As TCM and Western medicine represent two distinct medical approaches with different origins, both diagnostic strategies and interpretations of symptoms of diseases in TCM are quite different from those of Western medicine. As the mystery goes, TCM provides an 'unscientific' but yet 'successful' approach to medical practice. It has therefore attracted the efforts of many researchers in deciphering the "science' behind TCM. This will be instrumental in the acceptance and promotion of the practice of TCM in the global arena for the betterment of mankind.

According to TCM theory, the human body consists of five Zang and six Fu (i.e., all visceral organs), which are characterized by the five elements, namely Metal, Wood, Water, Fire and Earth, in the realm of the "Five Element" theory. The five Zang are functionally interlinked with each other by generating and restricting mode of action, resulting in an optimally functioning body by maintaining a holistic Yin-Yang balance. Disease results when this balance is distorted, as in the cases of over-restricting and counter-restricting (i.e., insulting). Furthermore, the Zang-Fu interplay responds to environmental conditions, and these conditions – referred to as "external evils", can distort the Yin-Yang balance and resulting in disease.

In this article, we focus on understanding the concept of dampness, one of the "external evils" commonly occurring in individuals living in areas with high humidity. According to TCM theory, exposure to humid weather conditions can induce dampness in the body. Water associated with dampness can upset the function of the Spleen, one of the Zang with Earth characters, as Water acts by insulting the Earth. Thus, prior to investigating what pathophysiological conditions are influenced by dampness, an understanding of the function of the Spleen in TCM is essential. The functions of the Spleen in relation to TCM theory will first be reviewed. Symptoms of Spleen deficiency (i.e., a decline in Spleen function) and their treatments by TCM herbal formulations will then be described, with pharmacological activities of the formulations being illustrated in terms of Western medicine. Finally, an interesting concept in TCM concerning how anxiety might impair Spleen function will be discussed.

Functions of Spleen

TCM theory purports that there are three aspects of Spleen function (Figure 1). Firstly, the Spleen regulates the transport and metabolism of water and nutrients in the body. Stomach, the associated Fu of the Spleen, works to digest ingested food into various components, which are transported to the Spleen for distribution throughout different parts of the body. Water absorbed will be transported upward to the Lung for the generation of Qi, and excessive water and metabolic wastes produced by different regions of the body are transported downward to the Kidney for excretion[1]. The accumulation of "humor", as in the case of edema or phlegm formation, is regarded as a pathological outcome of Spleen deficiency. Spleen deficiency can also lead to a malfunctioning of food digestion and absorption, or even a pathophysiological condition known as "metabolic syndrome"[2]. A study has shown that Glutinous Rice, which is regarded as a functional food for strengthening Spleen function, improves digestive function in rats with Spleen deficiency. The beneficial effect of Glutinous Rice on digestive function is associated with increases in plasma levels of gastrin, motilin and amylase, as well as a decrease in plasma level of somatostatin[3]. Experimental findings suggest that the Spleen is functionally related to digestive processes in Western medicine. Also, a rat model of Spleen deficiency associated with dampness-heat was found to have the over-expression of aquaporin, a water channel commonly found in the lungs, digestive system and kidney, suggesting that the function of the Spleen may be related to the functioning of these systems in regulating water content in the body[4].

Secondly, the Spleen regulates the circulation of blood. Spleen functions to enable the flow of blood within blood vessels in the right direction and then deliver nutrients (Qi) throughout the body. Thus, sub-cutaneous bruising and hemorrhage, such as conditions associated with hematuria and excessive menstrual bleeding, are caused by Spleen malfunctioning[1]. From the Western medicine point of view, the prevention of internal bruising is regarded as a function of the blood/circulatory system, through the regulation of blood clotting and capillary permeability, with the latter preventing the leakage of red blood cells into the extracellular space. Research has shown that patients with Spleen deficiency generally show an abnormal morphology of blood platelets, leading to a decrease in their ability to aggregate and release clotting factors. Thrombocytes in Spleen deficiency patients have been found to exhibit a shorter lifespan, resulting in a higher likelihood of hemorrhage. Spleen deficiency patients were also found to have an increased capillary fragility, such that that they are more prone to capillary rupture, leading to internal bruising.

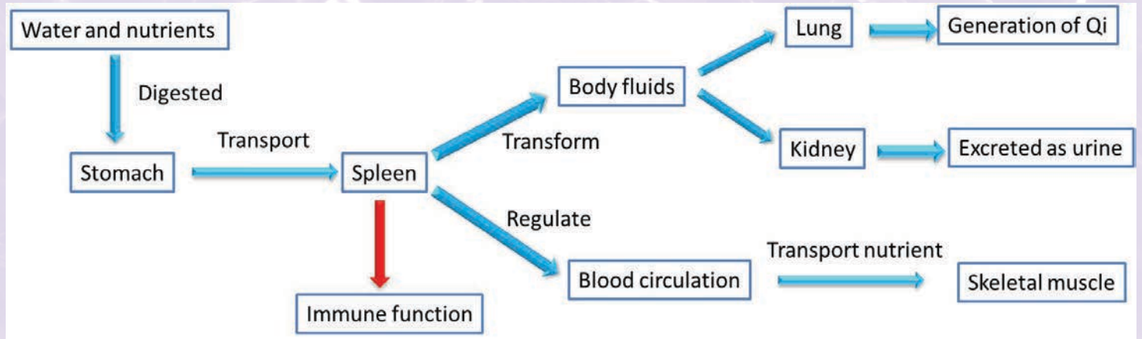

Figure 1. The functions of Spleen in TCM
The Spleen works with the Stomach to regulate the transport and metabolism of water and nutrients. Water absorbed is transported upward to the Lungs for the generation of Qi, and excessive water plus metabolic wastes produced by different regions of the body are transported downward to the Kidney for excretion. In addition, the Spleen regulates the circulation of blood. The transport of nutrients in blood to skeletal muscle is controlled by the Spleen. Therefore, Spleen appears to be an important determinant for maintaining a proper functioning of skeletal muscle. The Spleen is also related to immune function.

In connection with the functions of nutrient metabolism and transport as well blood circulation, the Spleen appears to be an important determinant for the maintenance of proper functioning of skeletal muscle. This is because the transport of nutrients in blood to skeletal muscle is controlled by the Spleen. This is corroborated by the experimental observations that both the configuration and function of extensor muscle were significantly deteriorated in mice with Spleen deficiency[5], and that Spleen deficient patients have higher blood lactate levels, as a result of anaerobic glycolysis in skeletal muscles[6]. These observations may well explain why tiredness and muscle pain are commonly observed in patients with Spleen deficiency.

Thirdly, the Spleen is related to immune function. TCM theory states that one will not be influenced by "external evils" if the Spleen is functioning optimally. The Spleen, being endowed with the Earth nature, is thought to be the center of other elements. If the Spleen functions well, other Zang will also be better off [1]. Results from a number of studies have established the functional relationship between the Spleen and the immune system. Patients with Type 2 Diabetes Mellitus with Spleen deficiency showed an obvious immune dysfunction (i.e., either hypo- or hyper-activity of immune cells[7]. Patients suffering from ulcerative colitis with Spleen/Kidney Yang deficiency showed a reduction of serum Treg and TGFβ1 levels, indicative of an impairment in immune tolerance[8]. Cang Zhu (Atractylodis Chinensis Rhizoma), a Spleen-invigorating herb, has been found to improve the immune function of rats with Spleen deficiency as well as protect and repair damaged mucosal tissues[9].

TCM approach to the treatment of Spleen deficiency

The effectiveness of various TCM herbal formulations for the treatment of various patterns of Spleen deficiency has been well established[10], but the underlying pharmacological mechanisms are relatively unclear. Gui Pi Tang (Restore the Spleen Decoction) and Huang Tu Tang (Yellow Earth Decoction), which are two commonly prescribed preparations for the treatment of Spleen deficiency, have been investigated for their pharmacological properties[11].

Herbal components in the two formulations act mainly on the digestive system[11]. The main constituent herb in Gui Pi Tang (Restore the Spleen Decoction) namely Huang Qi (Astragali Sinesis Radix), has been found to reduce the secretion of gastric juice and suppress the activity of pepsin by reducing the secretion of gastrin, thereby preventing the development of ulcers[12]. Bai Zhu (Atractylodes Macrocephala Rhizoma) protects gastric mucosa against gastric acid-induced injury, and it also suppresses abnormal peristaltic motion in the small intestine[13] [14]. Gan Cao (Glycyrrhiza Uralensis Radix) suppresses the secretion of gastric juice and reduces the acidity of gastric juice by neutralizing the hydrochloric acid[15-17]. The main herbal constituent of Huang Tu Tang (Yellow Earth Decoction), namely, Zao Xin Tu / Fu Long Gan (Ignited Yellow Earth; Terra Flava Usta), is rich in aluminum oxide, which protects the gastric mucosa by neutralizing acidic gastric juice[18-20]. Zhi Fu Zi (Aconiti Lateralis Preparata Radix) in Huang Tu Tang (Yellow Earth Decoction) was found to suppress gastric emptying, and protect against gastric ulceration[21-23]. Bai Zhu and Gan Cao in the preparation also produced significant protection to the digestive system [13-17].

Gui Pi Tang (Restore the Spleen Decoction) and Huang Tu Tang (Yellow Earth Decoction) contain medicinal herbs that can suppress hemorrhage and facilitate blood flow. Huang Qi in Gui Pi Tang was found to prevent thrombus formation in blood vessels by inhibiting the action of phosphodiesterase. Huang Qi also improves the microcirculation and reduces the viscosity of blood[24]. Huang Qi and the "assistant" herb, Ginseng (Panax Ginseng Radix), can dilate blood vessels and promote a smooth flow of blood. Ginsenoside Rg1 and Rg3 in Ginseng were found to decrease blood viscosity and prevent the aggregation of thrombocytes[25] [26]. Zao Xin Tu (Terra Flava Usta) in Huang Tu Tang (Yellow Earth Decoction) is calcium-rich, and its "assistant" herb, Donkey-hide Gelatin (Er Jiao; Corii Asini Colla), is rich in glycine that can promote the uptake of calcium, an essential factor in blood clotting (i.e., preventing internal bleeding). Donkey-hide Gelatin also reduces blood clotting time, and increases the number of plasma thrombocytes[27]. Zhi Fu Zi in Huang Tu Tang also promotes the agglutination of thrombocytes[21-23]. It was observed that opposing pharmacological actions are produced by Gui Pi Tang (Restore the Spleen Decoction) and Huang Tu Tang (Yellow Earth Decoction), with the former reducing blood clot formation and thus smoothening blood flow, and the latter facilitating blood clot formation and preventing internal bleeding. Yet, both formulations are effective in treating Spleen deficiency[11] [21].

With respect to the enhancement of immune function, Huang Qi in Gui Pi Tang (Restore the Spleen Decoction) contains Astragalus polysaccharides that can boost immunity by inhibiting the action of suppressive T-cells and thereby increase the activities of other types of T-cells, as well as stimulating the growth of plasma cells for the production of antibodies. Various herbal components in the formulation regulate the production of immunoglobulins and increase the activity of natural killer cells. Huang Qi has been found to induce the γ -interferons and thereby boost the activity of natural killer cells[28]. Ginsenosides from Ginseng increases the concentration of IgG, IgA, IgM and IL-2 in plasma, and stimulates the activity of natural killer cells and other types of white blood cells[25] [26] [29]. Guang Pi Tang (Restore the Spleen Decoction) was found to be effective in suppressing the production of autoantibodies in patients with chronic immune thrombocytopenic purpura, an autoimmune disease characterized by a reduction in the number of thrombocytes [30]. Donkey-hide Gelatin in Huang Tu Tang (Yellow Earth Decoction) was found to increase the phagocytotic activity of monocytes and the activity of natural killer cells. Bai Zhu stimulates the production of antibodies and the activity of phagocytes by increasing the production of IL-1 and IL-2 from lymphocytes. Baicalin in Huang Qin (Scutellariae Baicalensis Radix) increases the amount of cAMP in monocytes, thereby promoting the differentiation of lymphocytes. Gan Cao can induce the production of interferons that can activate natural killer cells. Gan Cao suppresses the immune response by decreasing the concentration of antigens, and glycyrrhinic acid in Gan Cao was found to enhance the production of IL-1 and immunoglobulins[31] [32]. Taken together, herbal formulations for treating Spleen deficiency also possess immunomodulatory activity.

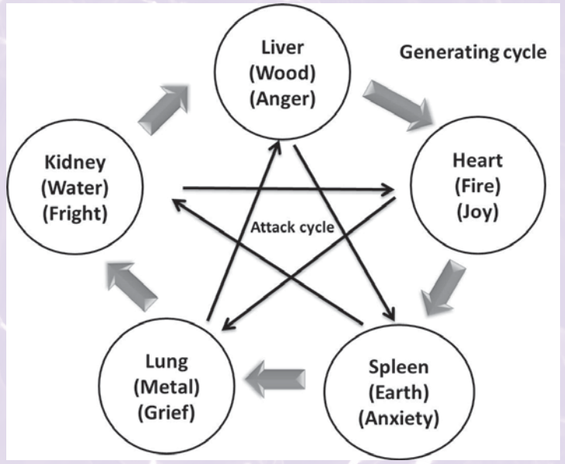

Figure 2. Relationship between Zang-fu and Five Zhi in TCM

Five Zhi, namely, joy, anger, grief, anxiety and fright, are characterized by five elements, namely, Fire, Wood, Metal, Earth and Water, respectively. As Zang-fu are linked to the five elements, the over-expression of each Zhi can affect the function of its respective Zang-fu. In addition, there is a generating cycle and restricting (or attack) cycle in which the five Zang-fu interact. The generating cycle describes the ways in which each element, serving as a mother, promotes the growth and development of the following child element. The restricting cycle provides for a check and balance system among all of the elements. The third form of interaction, namely insulting (not shown in the figure), describes the triggering of the attack. Thus, the direction of the insulting is the reverse of the restricting cycle.

Anxiety and Spleen function

The practice of TCM adopts a holistic approach in making diagnosis of diseases, with the categorization of symptoms into various patterns of Zang-fu (i.e. visceral organs) disorders. Furthermore, TCM views that various emotions, or Qing Zhi, do influence an individual's physiological functions.

In TCM theory, there are seven Qing - five of which are collectively called Zhi. The five Zhi, namely, joy, anger, grief, anxiety and fright, are characterized by five elements, namely, Fire, Wood, Metal, Earth and Water, respectively. As Zang-fu are linked to these five elements, the over-expression of each Zhi can affect the function of its respective Zang-fu. In light of the Five Element theory, all Zhi are related by generating, restricting, over-restricting and reverse-restricting one another (Figure 2). Thus, balancing the expression of the five Zhi is thought to be crucial in maintaining psychological and physical health[33].

Both Spleen and anxiety belong to the Earth, giving rise to a TCM theory stating that 'Anxiety impairs Spleen'. According to TCM theory, over-focusing or over-thinking on one subject will lead to anxiety, with resultant dysfunction in the transport of water and nutrients around the body and the stagnation of Qi (energy/ nutrients), indicative of a poorly functioning of the Spleen. Zhi arises as a phenotype of an outcome from one's thoughts, and prolonged anxiety can worsen the functions of other Zang, which is consistent with the inter-functional relationship among various Zang[33]. Interestingly, anger can be used to alleviate anxiety. Anger belongs to Wood, which restricts the Earth according to the Five Element theory. Thus, by inducing a state of rage, the effects of anger can effectively alleviate a state of anxiety[33]. Although such psychotherapy is theoretically sound, little is currently known about the scientific basis of such treatment.

It is worth noting the difference between stress and anxiety. Stress can be defined as a short-term psychological pressure when only limited resources are available to finish a task, whereas anxiety can be defined as a long-term worry about something uncertain in the future. Yet, a prolonged state of stress can also lead to anxiety. Modern biomedical research has shown a causal relationship between anxiety and Spleen-regulated function, but the physiological characteristic of anxiety should first be defined prior to achieving an understanding of such an interrelationship. Studies have shown that general anxiety disorder (GAD) can be characterized by an asymmetrical expression of the sympathetic nervous system (SNS) and the hypothalamic-pituitary-adrenal (HPA) axis[34]. Based on this observation, it can be deduced that the influence of anxiety on Spleen function is likely mediated by both nervous and endocrine factors. The SNS, a component of the autonomic nervous system, serves to inhibit digestive functions (including peristalsis) and the enteric nervous system, an intrinsic nervous system in the digestive process. The HPA axis regulates a series of endocrine glands, wherein the hypothalamus secretes corticotropin-releasing hormone (CRH) that stimulates the pituitary gland to secrete adrenocorticotropic hormone (ACTH), and ACTH in turn stimulates the secretion of cortisol from the adrenal cortex (Figure 3).

In Western medicine, general anxiety disorder (GAD) can be characterized by the asymmetrical expression between the sympathetic nervous system (SNS) and the hypothalamal-pituitary-adrenal (HPA) axis. The SNS serves to inhibit

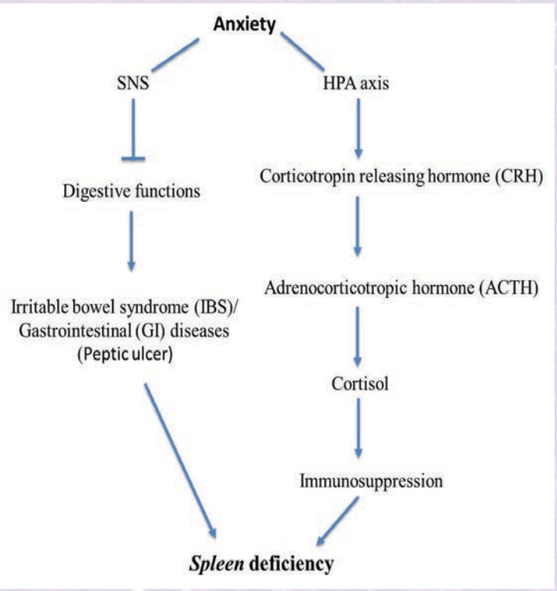

Figure 3. Anxiety and Spleen deficiency

digestive functions. The over-stimulation or under-stimulation of the digestive system by SNS, leads to contradicting irritable bowel (IBS) symptoms and gastrointestinal (GI) diseases, which are associated with Spleen deficiency in TCM. On the other hand, the HPA axis regulates a series of endocrine glands, wherein the hypothalamus secretes corticotropin releasing hormone (CRH) that stimulates the pituitary gland to secrete adrenocorticotropic hormone (ACTH), and ACTH in turn stimulates the secretion of cortisol from the adrenal cortex, with resultant immunosuppression and thus Spleen deficiency. The secretion of cortisol, which is also stimulated by cytokines, can inhibit the further production of cytokines. This negative feedback loop of regulation is primarily used to prevent the over-activation of the immune system.

Cortisol primarily activates gluconeogenesis and the metabolism of fat, protein and carbohydrate in cells. However, the effect of immunosuppression by cortisol explains the functional relationship between HPA axis and the Spleen, with the latter being a regulator of immune function. The secretion of cortisol, which is stimulated by cytokines, can inhibit the further production of cytokines by immunosuppression, and this negative feedback loop of regulation is primarily used to prevent the over-activation of the immune system[35]. However, cortisol, as a 'stress' hormone, has been found to be strongly associated with anxiety. The overproduction of cortisol under conditions of anxiety leads to immunosuppression, a symptom of Spleen deficiency in TCM. Other studies have found that GAD patients have a lower level of peripheral benzodiazepine receptors on their T lymphocytes[36], suggesting that benzodiazepines (which are anti-anxiety drugs) may also exert a regulatory effect on immune function[37].

The correlation between anxiety and gastrointestinal (GI) diseases has been studied. It was found that irritable bowel syndrome (IBS) was closely associated with anxiety[38]. IBS is a collection of patterns of altered bowel movement in the absence of any damage in GI tract[39]. This may be explained by the over-stimulation or under-stimulation of the digestive system by the SNS, leading to contradicting IBS symptoms such as constipation and diarrhea. A study also showed that stressors can disrupt the function of GI microbiota by inducing a neural response, which increases the risk

of mucosal infection and inflammation. Stress on the GI mucosal immune system can lead to the translocation of pathogenic microbes from the GI tract to the interior of the body, with the resultant infection and the associated inflammatory response[40]. Severe and sustained anxiety can induce peptic ulceration. Symptoms of peptic ulcer, including digestive discomfort and bleeding along the digestive tract, can be related with Spleen deficiency, in which the Spleen fails to sustain the function of the digestive system and regulate the circulation of blood.

A causal relationship between anxiety and peptic ulceration is supported by clinical and experimental observations. It has been shown, for example, that stress, which is correlated to anxiety, can cause peptic ulcer in absence of Helicobacter pylori[40]. An increase in the number of patients with peptic ulcers that are not caused by bacteria or non-steroidal anti-inflammatory drugs was observed after the traumatic earthquake in East Japan on 11st March, 2011, suggesting that psychological stress arising from this natural disaster can be a significant factor in causing peptic ulcers[41]. 'Executive monkey' studies have also shown that animals that had been exposed to stressors were more prone to developing gastric ulcers[42].

The causal relationship between psychological stress and peptic ulceration can be explained by the adverse effect of the SNS innervation of the mucosa and gut-associated lymphoid tissue (GALT). Sympathetic nerve fibers enter the alimentary canal along arteries and eventually terminate on blood vessels in the close vicinity of the mucosa. As such, mucus secretoneurone is regulated by inhibitory signals via α2 adrenergic signaling with noradrenaline as the neurotransmitter. Sympathetic noradrenergic nerve fibers also innervate the interdomal region of the submucosa with T-lymphocytes and plasma cells[43]. While the mechanism by which over-innervation of the SNS can produce an immunomodulatory action remains unclear, a hypothesis concerning the development of peptic ulcers caused by anxiety can be postulated based on the relationship between the SNS and gastrointestinal mucosa. Since anxiety can be characterized by the over-stimulation of the SNS[44], overwhelming signals from the SNS may trigger a higher output of inhibitory signals that suppress the production or release of secretoneurone. This leads to a decreased production of mucus, resulting in erosion of the mucosa and muscle layer of the duodenum by gastric juice.

In TCM, it is believed that anxiety arises from an imbalance of Zang functions, wherein different combinations of functional imbalances among Zang result in various symptoms. Yet, as the Five Element theory goes, Earth, which is considered as the center of the five elements, will eventually be hindered by the imbalance of other elements. Thus, the treatment of different types of anxiety is primarily focused on invigorating the function of the Spleen[44]. Gui Pi Tang (Restore the Spleen Decoction), which is a commonly used formulation in treating anxiety, not only ameliorates the symptoms of Spleen deficiency caused by anxiety, but also directly alleviates anxiety. From the perspective of TCM theory, Gui Pi Tang (Restore the Spleen Decoction) mobilizes the stagnant Qi (energy / nutrients) and nourishes shen in the Heart, which is thought to be the master of Qing Zhi. As anxiety is pathologically-related to the stagnation of Qi, a smooth flow of Qi will ease anxiety[44]. The pharmacological properties of Gui Pi Tang (Restore the Spleen Decoction) have been investigated. In treating peptic ulcers, Dang Gui (Angelicae Sinensis Radix) can prevent bleeding in the alimentary canal caused by peptic ulceration. Huang Qi and Ginseng were found to be effective in preventing peptic ulcer development[12-21]. It was also observed that Gan Cao produced an anti-ulcer action by increasing gastric mucosal defensive factors[45]. Gan Cao also promotes the proliferation of gastric mucosal cells and protects the mucosa by releasing endogenous prostaglandins that can stimulate mucus production. On the other hand, Huang Qi, Gan Cao and Suan Zao Ren (Zizyphi Spinosae Semen) were found to produce a tranquillizing action [10] [11] [46-48].

On the basis of TCM theory, a causal relationship between anxiety and Spleen function has been clearly established. However, a recent study has shown that the status of GI microbiota can in turn induce anxiety-like behavior[49]. The complete removal of GI microbiota leads to a decrease in anxiety-like behavior and alteration in the neurochemistry of the central nervous system[50]. Such an interaction, known as the microbiome-gut-brain axis, is poorly understood in molecular and physiological terms, but the finding does suggest the possibility that the correlation between anxiety and Spleen function can be bi-directional. In this connection, patients with Spleen deficiency show a higher blood lactate level[6], which is consistent with the symptoms of tiredness and muscle fatigue in Spleen deficiency. While patients with GAD exhibited significantly higher blood lactate levels than those of control subjects after vigorous exercise (indicative of Spleen deficiency), anxiety attacks could be induced by the infusion of lactate into controls, suggesting that Spleen deficiency may also be a cause of anxiety [51].

The practice of TCM remains popular in Asian countries despite the advent of Western medicine. While TCM and Western medicine belong to two distinct treatment systems, the explanation of TCM theory in the context of Western medicine can hopefully bridge the theoretical gap between TCM and Western medicine and thus facilitate the integration of the two therapeutic approaches to the prevention and/or treatment of diseases. In this article, we have endeavored to describe the function of the Spleen in TCM using the language of Western medicine. Hopefully, concerted efforts of this type can serve to modernize the theory of TCM which can be comprehended by individuals living in the 21st century.

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Outdoor Functional Electrical Stimulation Exercise Cycling System for Spinal Cord Injured Persons

Abstract

This study developed an outdoor Functional Electrical Stimulation (FES) exercise cycling system for persons with the complete spinal cord injured (SCI) using electrical pulse to activate paralyzed muscles to generate cycling movement. The system aims to provide a fun outdoor training for SCI persons to exercise. The mechanical structure was specially designed to secure the SCI persons' leg position in the cycling system. six-phase-angle-driven control algorithm was designed to activate the quadriceps and hamstrings muscles. The on-off (20s-5s) stimulation pattern increased the duration of the stimulation before the muscle fatigue. The result showed exercise cycling system have beneficial effects on the SCI persons. The paralyzed lower limb muscles had regained the muscle bulk and reduced edema by the improvement of blood circulation. A complete SCI volunteer participated in this training for 6 months. Moreover, she attended the Cybathlon FES-bike competition in October 2016 in Zurich with the Team Phoenix from CUHK.

Introduction

Complete SCI persons at the thoracic level have no movement of the lower limb due to the communication between brain and peripheral nerves is disrupted. As a result, most of them become lifetime wheelchair users that have to overcome secondary health complications, such as cardiovascular disease, metabolic syndrome, hypertension, visceral adiposity, and muscle atrophy[1].

Regular exercise can provide beneficial advantages to the SCI persons. With the development of advanced rehabilitation technology, the FES has become a promising technique for SCI persons to exercise their paralyzed muscles since the early 1980s[2], which improved their quality of life significantly.

FES is the application that generate electrical pulses to stimulate the contraction of paralyzed muscles through the surface electrodes, thereby creating a functional movement that enables them to achieve different tasks, such as standing, walking, and cycling, and to overcome their long-term complications. The FES cycling is the most common regular exercise for SCI persons. It is safer and easy to operate. In addition, the reactivation of paralyzed muscles and functional movement by FES also have positive benefits to them, such as increase the strength of stimulated muscles, decrease the risk of decubitus, reduce the spasticity, and improve the metabolism[3-5].

The challenge of developing an effective FES exercise cycling system are the ergometer's mechanical structure[6], individualized stimulation pattern, and control algorithm[7]. The seating posture and the hip-ankle position are important parameters that affected the generated force during electrical stimulation. Schutte et al. presented a complicated musculoskeletal-ergometer model to evaluate various posture configurations, stimulation sequences, and stimulation load[6]. Their work demonstrated the correlations between the mechanical factors and the cycling possibilities for subjects with paraplegia.

A subject-specific stimulation pattern would provide a smooth and coordinated cycling movement. The conventional stimulation pattern for cycling is based on the muscle activation sequence involved in the movement. Referring to other studies on FES cycling, several types of stimulation pattern have been employed including on-off, ramp-like, or EMG linear envelope derived from the muscle activity pattern[8-10].

The control algorithm would affect the FES-cycling efficacy due to the time-varying characteristics of the stimulated muscle and the muscle endurance under the high density electrical stimulation. In many other FES applications, other than cycling, varied closed-loop control methods have been employed, such as the muscle force modulation[11 - 12], the control of cycling movement of lower leg[13], and the control of standing and locomotion[14].

This study developed a six-phase FES cycling system with subject-specified control algorithm for the recruited complete SCI person. A tricycle was modified including the installation of encoder, the enhancement of ankle orthoses, and the customized seat. Implementation with a real-time control algorithm, in order to trigger the stimulator to stimulate paralyzed muscles of SCI persons with a sequence of functional movement for the purpose of pedaling.

Figure 1. The SCI volunteer attending the Cybathlon competition in October 2016

Figure 2. The FES stimulator

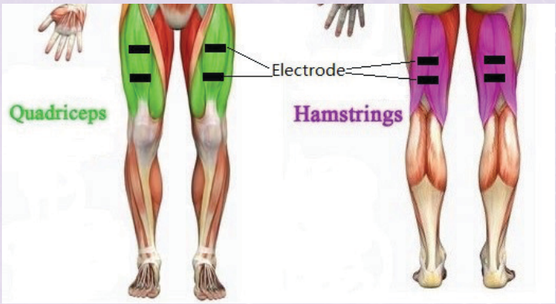

Figure 3. Electrodes on the target muscles modified from http://www.askthetrainer.com/best -leg-exercises[15]

Stimulator

A modified portable four-channel programmable device (FineCure, Easy Walker, P2-9632) (Figure 2) was integrated into the system and controlled by our algorithm. This device is small (15cm x 8cm x 2.5cm) and light (400g). It was powered by a 12V battery and the stimulation parameter for stimulation were 50Hz. The bandwidth was between 100μs and 420μs. The intensity can be adjusted with the range between 0 and 100mA. These stimulation pulses were transmitted through the surface electrodes (PALS, Neurostimulation Electrodes 5cm * 9cm) to the target muscles (Figure 3) for the contraction.

Control Algorithm for Cycling System

Cycling Pattern

The cycling pattern of the system was using crankset angle to drive the stimulation pattern and to maintain the continuous cycling movement. The cycling pattern with four muscle groups (Figure 4) is shown as below.

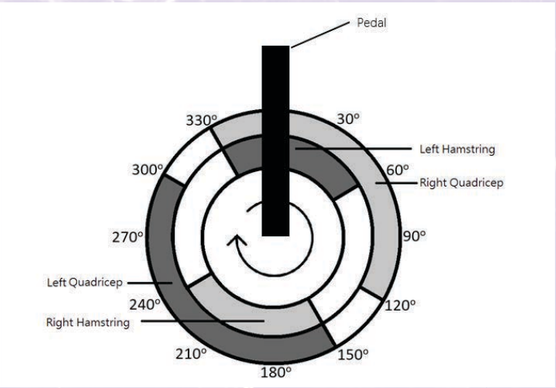

Figure 4. Stimulation pattern adopted for the cycling training

The stimulation cycle could be divided into six phases (Figure 5):

Phase 1: Right Leg Push, Left Leg Pull (330° to 60°)

Stimulation "ON" for right quadriceps and left hamstrings, and "OFF" for left quadriceps and right hamstrings. The contraction of right quadriceps pushed the right pedal forward and the left hamstrings pulled the left pedal backward.

Phase 2: Right Leg Push (60° to 120°)

Stimulation "ON" for right quadriceps only. The contraction of right quadriceps pushed the right pedal forward to generate enough momentum for Phase 3.

Phase 3: Transition (120° to 150°)

This phase was the resting period for all desired muscles. No force applied to the pedal, the momentum kept driving the cycling system to rotate in this transition period.

Phase 4: Left Leg Push, Right Leg Pull (150° to 240°)

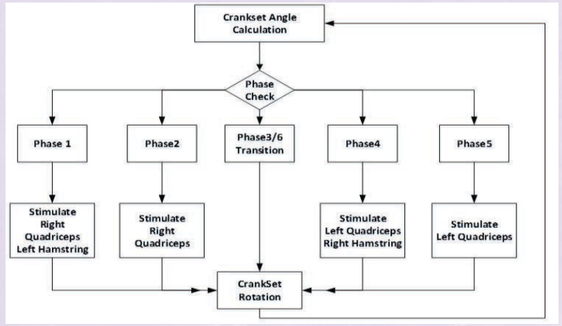

Figure 5. The flow diagram for the phase-control stimulation control algorithm

Stimulation "ON" for left quadriceps and right hamstrings, and "OFF" for right quadriceps and left hamstrings. The contraction of left quadriceps pushed the right pedal forward and the right hamstrings pulled the left pedal backward.

Phase 5: Left Leg Push (240° to 300°)

Stimulation "ON" for left quadriceps only. The contraction of left quadriceps pushed the right pedal forward to generate enough momentum for Phase 5.

Phase 6: Transition (300° to 330°)

This phase was the resting period for all desired muscles. No force applied to the pedal, the momentum kept driving the cycling system to rotate in this transition period.

Cycling Mode

The exercise cycling system consists of continuous mode and on-off mode (Figure 6).

The continuous mode was used for parameters checking and outdoor exercise cycling. The tricycle was placed on the roller stationary to obtain suitable values of intensity and bandwidth until a stable and smooth cycling movement was achieved for cycling on the ground. Placing the trike on the stationary was to reduce the friction between the wheels and the ground, hence reduced load to the SCI person.

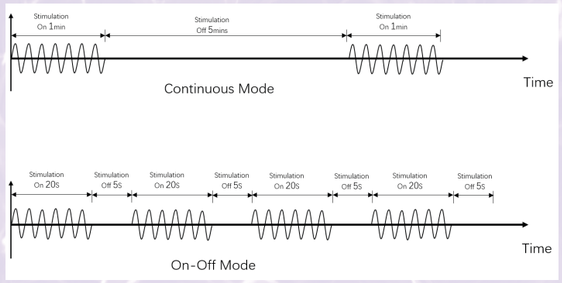

Figure 6. The stimulation pattern during Continuous Mode (upper) and On-Off Mode (lower)

The on-off mode can be used for outdoor exercise cycling. The on-off mode was designed to enable SCI persons to complete 20s cycling with 5s rest. It was designed to prolong the cycling duration before the muscle fatigue.

Mechanical Structure

Mechanical Design of the Cycling System

A tricycle (Figure 7) was specially redesigned to facilitate the FES cycling and safety. The distance between the crankset and the seat were adjustable which can accommodate to different legs' length of SCI persons. The start/stop and emergency buttons were built on the left and right handlebars respectively that SCI persons can operate the tricycle all by themselves easily. The design of cycling system was angle-driven basis; therefore, a rotary encoder was installed for real-time angle with 200Hz sampling frequency.

Figure 7. The overall structure of the cycling system including customized seat with seat-raiser, encoder, and ankle orthoses

Customized Seat with Seat-raiser

To ensure the SCI persons' cycling posture, especially the hip-knee-ankle structure, an anatomically contoured shape hard-shell carbon fiber seat with a seatbelt was mounted on the tricycle. The hard-shell seat with anti-slip pad and the seat-raiser help in the prevention of slipping down and to keep the hip joint in proper position, therefore a driving force induced by the muscles contraction can effectively transmitted to the pedal.

Figure 8. The front view (left) and side view (right) of the ankle orthoses with L-shape profiler

Ankle Orthoses

The SCI persons cannot control their lower limb posture during cycling that would affect the driving force applied to the pedal. In order to solve this problem, ankle supports with L-shape profiler (Figure 8) were added for maintaining the legs in the sagittal plane. The enhancement was able to keep the ankle-knee-hip joints aligned with the pedal to optimize the forward driving force. Besides, the L-shape profiler was mounted between the pedal and the side of the heel support that aims to prevent the hip abduction during cycling.

Case Report

A 20-year old female SCI volunteer with thoracic spinal fracture participated in this training for six months. She suffered spinal decompression since March 2011 and posterior spinal fusion was performed. She has completely lost motor and sensory functions below T6-T7 injury level. She is currently having scoliosis over thoracolumbar area and the status is stable.

Result

After completed the six-month training period, FES cycling exercises showed that the muscle condition of SCI person significantly obtained beneficial improvement on the characteristics of lower limb, in terms of increasing in bulk of stimulated muscles and its flexibility, and improving the edema. Obviously, the outcome of cycling exercises on the SCI persons can be observed that the size of both legs is more symmetrical after 6 months. The system has been successfully implemented and the volunteer had participated in the Cybathlon competition, a YouTube video has been uploaded and can be found in the following url: https://www.youtube.com/watch?v=4rG1tIicrWk

The SCI person cycled with the continuous mode can only last for 1 minute and took longer time to recover. On the other hand, the duration of on-off cycling can last for 2.5 minutes or 100 meters in distance until muscle fatigue because of the increase of muscular endurance.

The limitation of the system is the FES device only has four channels that restrict the muscle selection which only quadriceps and hamstrings can be stimulated for the cycling using surface electrodes. More deep muscle groups can be stimulated using implant electrodes in the future study.

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Effect of ProPectin on Patients with Elevated Cholesterol Levels: A Clinical Pilot Study

by R. Dimitrova, Chemical Engineer, Research Associate, Bulgarian Academy of Sciences and Z. Velichkova, Biologist

Abstract

The purpose of the study is to follow the effect of ProPectin on volunteers with different cholesterol levels who take the product for a period of 25 weeks.

Introduction

Bulgaria is one of the leading countries in the world in incidence of cardiovascular diseases, which are one of the most frequent causes of death in the country.

The elevated cholesterol levels and the imbalance in the level of lipids in the blood is a major risk factor for cardiovascular disease, some types of diabetes, malignancy, indigestion, obesity and other diseases.

Pectin is a naturally distributed polysaccharide that has gained in importance and use in recent years. This growing interest in it is due to its qualities as a bio-regulator. Its biodegradability and its gel-forming qualities allow it to be used in the food and pharmacy industry.

Materials and Dosage

The study participants taking oral ProPectin (a solution containing highly esterified apple pectin and fructose) at 9 g daily divided into three equal doses three times over a course of 175 days.

Protocol of the Study

The study was conducted on three groups of volunteers – 45 people.

The first of the three groups consisted of 25 people (14 women and 11 men) with an overall cholesterol level above 6 mmol/l., including 12 smokers and 4 diabetics.

In the second group, all the participants had normal overall cholesterol levels (up to 4.9 mmol/l). There were 15 healthy volunteers participating in this control group (10 women and 5 men). Two of them were smokers.

The third group consisted of 5 volunteers (3 women and 2 men) with an overall cholesterol level above 6.2 mmol/l. The age of all the participants in the ProPectin test was between 25 and 60 years.

Method

Before the participants began taking ProPectin (a highly esterified apple pectin and fructose), their cholesterol levels (overall, LDL, HDL and triglycerides) were reported, as the test subjects had not had any food for a period of 12 hours before the study.

All the test subjects from the three groups were placed on the same diet, with a controlled food intake of up to 330 mg of cholesterol daily. Only participants in the first two groups received ProPectin, three times daily on an empty stomach for a period of 25 weeks for each dose of ProPectin.

The volunteers from the third group did not receive ProPectin during the study.

Analysis of the Data and Results

It was reported that as early as the third week there was a decrease in the total amount of cholesterol, LDL and triglycerides. The decrease in the total cholesterol level in the women in the first group was higher than in the men.

For some of the participants in the first group who had hypertension, a reduction in blood pressure was reported by the end of the first month. In 23 out of a total of 25 people in the first group, a decrease in the amount of cholesterol was reported.

In the control group there was no significant change in the amount. A greater difference was reported in the cholesterol levels during the first 4 weeks than during the rest of the period, and the decreasing tendency in the lipid parameters continued until the end of the study, but at a slower pace.

Table 1

Period	Total Cholesterol		LDL		Triglycerides	
	First Group	Control	First Group	Control	First Group	Control
1st month	6.7 mmol/l	4.2 mmol/l	5.1 mmol/l	2.7 mmol/l	2.6 mmol/l	1.8 mmol/l
2nd month	6.2 mmol/l	4.1 mmol/l	4.6 mmol/l	2.6 mmol/l	2.5 mmol/l	1.8 mmol/l
3rd month	6.0 mmol/l	4 mmol/l	4.2 mmol/l	2.5 mmol/l	2.4 mmol/l	1.8 mmol/l
4th month	5.9 mmol/l	4 mmol/l	3.8 mmol/l	2.5 mmol/l	2.3 mmol/l	1.7 mmol/l
5th month	5.6 mmol/l	4 mmol/l	3.3 mmol/l	2.5 mmol/l	2.2 mmol/l	1.7 mmol/l
6th month	5.2 mmol/l	4 mmol/l	3.1 mmol/l	2.5 mmol/l	2.1 mmol/l	1.6 mmol/l

*The amounts for the individual groups are averaged.

Table 2

Period	Total Cholesterol		LDL		Triglycerides	
	First Group	Third Group	First Group	Third Group	First Group	Third Group
1st month	6.7 mmol/l	6.4 mmol/l	5.1 mmol/l	5.0 mmol/l	2.6 mmol/l	2.4 mmol/l
2nd month	6.4 mmol/l	6.3 mmol/l	4.6 mmol/l	4.9 mmol/l	2.5 mmol/l	2.3 mmol/l
3rd month	6.1 mmol/l	6.4 mmol/l	4.2 mmol/l	5.0 mmol/l	2.4 mmol/l	2.4 mmol/l
4th month	5.9 mmol/l	6.4 mmol/l	3.8 mmol/l	5.0 mmol/l	2.3 mmol/l	2.4 mmol/l
5th month	5.6 mmol/l	6.4 mmol/l	3.3 mmol/l	5.0 mmol/l	2.2 mmol/l	2.4 mmol/l
6th month	5.2 mmol/l	6.3 mmol/l	3.1 mmol/l	5.0 mmol/l	2.1 mmol/l	2.4 mmol/l

*The amounts for the individual groups are averaged.

(Table 1) At the time of the study, a biochemical analysis of the electrolytes in the blood was conducted, and no significant changes were reported in their values. In conclusion, based on the study of 40 volunteers, it was established that taking ProPectin leads to a decrease in total cholesterol and LDL cholesterol, as well as triglycerides, which indicates that ProPectin is suitable for the prevention of cardiovascular diseases and certain forms of diabetes.

(Table 2) In the group that was simply put on a diet without taking ProPectin, no significant changes were noticed in the total cholesterol, the LDL cholesterol or the triglycerides, which once again confirms the effectiveness of ProPectin.

Conclusion

Based on the study of the effects and effectiveness of the ProPectin product on a total of 45 volunteers, only 40 of which were given ProPectin, we may make the following conclusion:

The inclusion of the ProPectin product in a comprehensive therapy for treatment or prevention would increase its effectiveness. This study shows that regular intake of apple pectin has a healing effect on the human body. In people with disorders in the lipid balance, ProPectin leads to a reduction in overall cholesterol as well as LDL, and it restores the lipid balance.

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以健康信念模式探討影響澳門女性乳房自我檢查之因素

【摘要】

目的

瞭解澳門女性乳房自我檢查行為、以健康信念模式探討澳門女性乳房自我檢查行為的影響因素。

方法

澳門某一婦女團體，方便採樣形式以健康信念量表對733例符合標準的女性進行問卷調查。

結果

澳門女性的健康信念總平均分為（3.15±0.40），其中以自覺利益性認知得分最高，自覺罹患及障礙性認知的信念水平較低；曾執行乳房自我檢查行為佔77.1%，定期執行的有33.4%；自覺利益、障礙性、行動線索及自我效能的信念與乳房自我檢查行為都有顯著差異（p<0.00~0.05），進行Logistic強制回歸分析自覺障礙性得分每減少一分（OR值為0.890，95%CI：0.847~0.936）及自我效能每增加一分（OR值為1.228，95% CI：1.111~1.357）則愈傾向執行乳房自我檢查行為（p<0.00）；年齡、婚姻、生育、停經狀況、朋友曾否患有乳房疾病、個人曾否接受過乳房自我檢查衛生教育與乳房自我檢查行為均具統計學顯著差異（p<0.05），進行Logistic強制回歸分析影響因素有居住黑沙環、筷子基、塔石及氹仔地區的女性、曾停經、個人曾接受過乳房自我檢查衛生教育的女性則愈傾向執行乳房自我檢查行為（p <0.05）。

結論

女性的定期執行率及自我罹患乳癌的認知偏低，自覺障礙性、自我效能、居住地不同、曾停經、曾接受相關健康教育的女性均會影響女性執行乳房自我檢查行為；健康教育的重點應關注女性的「自覺罹患及障礙性

認知，強化宣導執行的利益性，同時針對影響因素，採取有效的措施進行衛生教育及干預，提高女性的乳房自我檢查行為，培養關注自身健康帶來的益處，達到早期發現，及早治療，以便減少治療所承受的痛苦及傷害，提升生活品質。

引言

乳癌為全球及澳門女性重要致命之癌症，目前澳門乳癌的發病率有持續升高及年輕化趨勢[1] [2]，早期發現能提高乳癌的治癒率[3]及可進行保乳手術，降低了對女性特徵的傷害，提高生活品質[4]。基於女性害怕在陌生人前暴露乳房及因疼痛而不願意定期執行乳腺造影檢查，故執行乳房自我檢查對發現自身乳房有異常情況顯得十分重要[5]，研究調查發現澳門女性受訪者中只有24.8%曾執行乳房自我檢查[6]，無論國內、外[7-12]普遍都不高，影響因素包括有忘記執行、未婚、教育程度低、認為沒有必要執行、所獲得的健康資訊缺乏、傳統文化信仰宿命論等[11-16]。

健康信念（Health Belief Model，簡稱HBM）為解釋民眾採取預防性健康行為理論模式，該理論包括六個維度：自覺罹患性、自覺嚴重性、自覺利益性、自覺障礙性、行動線索和自我效能[17]。其常被護理工作者來預測服務對象的預防性健康行為及實施健康教育評價的工具[18]。國內外[11-13][19-23]均有研究利用健康信念來探討女性的乳房自我檢查行為，但其普遍只有運用個別或數個維度，並且各條目均依據各國的文化背景加以修正，故本研究利用健康信念六個維度為基礎，探索影響澳門女性乳房自我檢查行為的影響因素。

研究對象與方法

研究對象

採用方便抽樣法，調查自2012年9月01日至2012年11月期間澳門某一婦女團體籌辦活動時之參與者。納入標準：1.2012年5月滿十八歲週歲之澳門女性居民；2.能聽及閱讀中文溝通並知情同意。排除標準：正在懷孕女性。共發放問卷份850份，回收問卷800份，其中有效問卷733份，有效回收率86.2%。733名研究對象的分佈情形（見表1）。

研究方法

本研究採用問卷調查的方法，為自評問卷。由研究者統一發放，即場收回。

測量工具

(1)修正因素

修正因素包括兩部份，①基本人口學資料包括研究對象年齡、宗教信仰、職業、文化程度、個人每月收入、居住地區、居住澳門年期；②罹患乳癌高危因素包括婚姻、生育、停經狀況、個人曾否患有乳房疾病、家人曾否患有乳房疾病、朋友曾否患有乳房疾病、個人曾否接受過乳房自我檢查衛生教育等。

(2)健康信念量表

參考了相關文獻後[24-26]，自行設計問卷，共6個維度31個條目，包括自覺罹患性、自覺嚴重性、自覺利益性、自覺障礙性、行動線索和自我效能。量表採用Likert 5級評分法，其中，非常不同意計1分，不同意計2分，無意見計3分，同意計4分，非常同意計5分。得分越高，表示對採取相應健康行為的信念越高，而自覺障礙性則相反，得分越高，表示對採取相應健康行為的信念越低。經5位醫學及護理專家評定，量表內容效度CVI為0.82，適合於研究人群。對20例符合納入標準的女性進行預試驗，測得其Cronbach's α 係數為0.802，重測信度為0.817。

(3)乳房自檢執行情況

共分為三個條目：①曾否執行乳房自我檢查行為；②過去一年曾否定期（每月一次）執行乳房自我檢查行為；③未來一年會否定期（每月一次）執行乳房自我檢查行為。

統計學分析

採用SPSS17.0軟體，對資料進行統計描述和t檢驗、 χ^2 檢驗及Logistic回歸分析。

結果

健康信念得分

研究對象健康信念總分為（97.8±10.65），條目均分（3.15±0.40）處於中等水平。各維度得分由高到低依次為：自覺利益性、自覺障礙性、自覺嚴重性、行動線索、自我效能、自覺罹患性（見表2）。研究對象自覺罹患乳癌可能性總分為（11.20±2.44），條目均分（2.78±0.15），顯示研究對象自覺罹患乳癌可能性偏低，各條目得分由高到底依次為：我覺得我的生活習慣很健康，不會罹患乳癌、我覺得在我生命中某時期可能會罹患乳癌、我覺得我可能會罹患乳癌、在未來幾年內，我罹患乳癌的機率很高。自覺罹患乳癌嚴重性總分為（16.20±3.41），條目均分（3.24±0.43），研究對象自覺罹患乳癌後的嚴重性為中等程度，各條目得分由高到底依次為：罹患乳癌會增加家人負擔、罹患乳癌會影響學業/ 事業前途、罹患乳癌會降低生活品質、罹患乳癌會影響我和親密伴侶（丈夫、男友）的關係、乳癌是不治之症。自覺執行乳房自我檢查行為之利益性總分為（21.45±4.63），條目均分（3.58±0.16），顯示其自覺利益性偏高，各條目得分由高到底依次為：每月定期做乳房自我檢查能早期發現乳房週邊組織的變化、早期發現乳房疾病，可以延長我的生命、相對給醫生檢查，乳房自我檢查更能提早發現乳房異常、進行乳房自我檢查能觀察到自己身體的變化、預防乳癌即我有自我保護的能力、乳房自我檢查可以自己在家裡做，不需到醫療機構，不需要金錢，很便利。自覺執行乳房自我檢查行為之障礙性總分為（19.05±4.42），條目均分（2.72±0.26），研究結果顯示研究對象的自覺障礙性偏低，各條目得分由高到底依次為：我常忘記做乳房自我檢查、我覺得要準備一獨立的房間做乳房自我檢查很困難、我工作繁忙，無時間做乳房自我檢查、我家務繁忙，無時間做乳房自我檢查、做乳房自我檢查令我很尷尬、醫生定期為我做乳房檢查，故不需作乳房自我檢查、朋友或家人知道我做乳房自我檢查會覺得我很奇怪。行動線索方面其總分為（16.67±3.59），條目均分（3.33±0.16），研究結果顯示研究對象獲得乳房自我檢查的資訊由高到底依次為：我從大眾媒體（包括電視、收音機、報章雜誌、網路）獲得定期乳房自我檢查的相關資訊、我從醫療機構（包括醫護人員、衛教單張、宣傳海報）獲得定期執行乳房自檢查的衛教資訊、朋友會告知我定期執行乳房自我檢查的好處、我身體健康檢查有異常，故有需要定期執行乳房自我檢查、家人會告知我定期執行乳房自我檢查的好處。其自我效能總分為（13.27±2.72），條目均分（3.32±0.25），顯示研究對象的自我效能中等水平，各條目得分由高到底依次為：假使乳房自我檢查結果是異常的，我也能面對，並尋求醫護人員的協助、我有信心能夠養成定期做乳房自我檢查的習慣、我能夠正確執行乳房自我檢查步驟、在乳房自我檢查時，我有能力分辨出異常腫塊（見表3）。

研究對象健康信念與乳房自我檢查行為差異性

以曾否執行乳房自我檢查行為為因變量，以健康信念總分為自變量作t檢驗，曾執行乳房自我檢查行為的女性健康信念總得分高於沒有執行的女性，經檢定後無顯著差異（p >0.05）。而以健康信念各維度包括：自覺罹患性、嚴重性、利益性、障礙性、行動線索和自我效能為自變量作t檢驗，經檢定後自覺利益性、障礙性、行動線索和自我效能得分均具統計學顯著差異（p <0.05），而自覺罹患性及嚴重性得分不具統計學顯著差異（p>0.05）（見表4）。

研究對象健康信念與乳房自我檢查行為的Logistic回歸分析

以乳房自我檢查行為為因變量，以健康信念各維度包括：自覺罹患性、嚴重性、利益性、障礙性、行動線索和自我效能為自變量進行Logistic強制回歸分析，結果發現自覺障礙性每減少一分（p<0.00，OR值為0.890，95% CI：0.847~0.936）及自我效能每增加一分（p<0.00，OR值為1.228，95% CI：1.111~1.357）兩個維度與乳房自我檢查行為具影響作用（見表5）。

研究對象修正因素與乳房自我檢查行為差異性

以曾否執行乳房自我檢查行為為因變量，以年齡、宗教信仰、職業、文化程度、個人每月收入、居住地區、居住澳門年期、婚姻、生育、停經狀況、個人曾否患有乳房疾病、家人曾否患有乳房疾病、朋友曾否患有乳房疾病、個人曾否接受過乳房自我檢查衛生教育為自變量作 χ^2 檢驗，經檢定後年齡、婚姻、生育、停經狀況、朋友曾否患有乳房疾病、個人曾否接受過乳房自我檢查衛生教育均具統計學顯著差異（p<0.05），其它的則不具統計學顯著差異（p>0.05）（見表8）。

研究對象修正因素與乳房自我檢查行為的Logistic回歸分析

以乳房自我檢查行為為因變量，以年齡、宗教信仰、職業、文化程度、個人每月收入、居住地區、居住澳門年期、婚姻、生育、停經狀況、個人曾否患有乳房疾病、家人曾否患有乳房疾病、朋友曾否患有乳房疾病、個人曾否接受過乳房自我檢查衛生教育為自變量，進行多因素Logistic強制回歸分析發現居住黑沙環、筷子基、塔石及氹仔地區的女性較海傍區的女性執行乳房自我檢查行為較積極、曾停經較未停經的女性，以及曾接受過乳房自我檢查衛生教育的女性有較高的執行情況（p<0.05）（見表7）。

討論

乳房自我檢查行為

研究對象中曾執行乳房自我檢查行為有565人（77.1%），與澳門[6]、國內[7]以及其它地區[8-12]的研究相比有較高的執行情況，這可能與本研究有54.8%的女性曾接受過相關衛生教育，而取樣地點的婦女團體不定期舉辦相關的衛生教育講座有關，這與劉純豔等[13]的研究指出曾接受相關衛生教育後的女性其乳房自我檢查行為執行情況有所提高相符。但能定期每月執行的只有245人（33.4%），其原因以「常忘記為首要障礙因素有54.4%，陳瑜等[27]的研究指出經電話或郵寄相關資料給受訪者後結果發現其執行率有所提升，說明若經由一些定時提醒女性執行乳房自我檢查行為的方法，可減少其遺忘等原因而無法定期執行，目前澳門衛生局都會經由手提電話發放流行病的訊息給市民，使其多加關注，故可經此途徑向18歲以上的女性居民定期發放有關資訊，以作提醒之效用。

影響女性執行乳房自我檢查行為的健康信念

研究結果顯示認為自己不會罹患乳癌佔34.5%，只有4.1%的人非常同意未來幾年會罹患乳癌，這可見澳門女性自覺罹患乳癌的可能性不高，與國外[19-21][23][28]的研究相符，與SecginliS.等[22]的研究不相同，這可能與其取樣為衛生中心就診的女性，其所獲得的乳癌知識及相關衛生教育較多所致；而本研究對象認為罹患乳癌後會增加家人負擔佔52.5%、有49.4%同意認為會影響事業及前途，可見澳門女性認為罹患乳癌後將會影響家人及工作，有58.7%同意進行乳房自我檢查能觀察到自己身體的變化情況，其次有48.6%的女性同意早期發現乳房疾病，可以延長生命，顯示澳門女性同意執行乳房自我檢查會為自身健康狀況帶來益處，這與國外[16][17][29]的研究相符。而就執行乳房自我檢查行為的障礙性方面，有24.1%同意家務繁忙、有25.9%同意工作繁忙而沒有執行，可見澳門女性對執行乳房自我檢查行的障礙因素不會因家務或工作而忽略，本研究指出障礙性得分每減少一分，其增加乳房自我檢查行為11%，這與國外[28][29]的研究相符。在實施健康教育時，應提高澳門女性的自覺罹患性認知，說明各年齡層均有機會罹患乳癌，尤以55歲以後有較高的發病率[2]，告知乳癌的治療方法及癒後，澳門的免費醫療及社會福利制度，可減輕其認為患病後會為自身及家庭所帶來的負擔，強化乳房自我檢查行為的好處，其優點是以個人為中心、簡便易行、不具侵入、無放射、安全無創傷性、無需付費等[30]，瞭解其障礙及困難，提出可行的建議，以提升其執行情況。

本研究對象中有68.2%的女性同意經由大眾媒體（包括電視、收音機、報章雜誌、網路）獲得相關資訊，有54.7%是經由醫療機構（包括醫護人員、衛教單張、宣傳海報）獲得，同時經由醫療機構所獲得的資訊具影響澳門女性執行乳房自我檢查行為差異，這與醫護人員提供的健康教育資訊具可信及專業性有關，其次是國內外暫沒有將行動線索與乳房自我檢查行為作一相關性探討，這發現有助於從哪一方面提供健康教育或相關資訊才具影響作用，同時表明由醫護人員較大眾媒體更具說服力。而本研究對象中有57.7%認為假使乳房自我檢查結果是異常的，也能面對，並尋求醫護人員的協助、有40.5%認為自己能夠正確執行乳房自我檢查步驟、但只有37.9%在執行時

有能力分辨出異常腫塊。故在進行健康教育時必須針對女性如何分辨出異常情況，以提升其自我效能，因曾執行乳房自我檢查行為的女性其條目均分（3.39±0.25）高於沒有執行（3.08±0.27），這與國外[21][28][29]的研究相同，本研究指出自我效能認知總得分每增加1分則女性執行乳房自我檢查行為增加1.228倍，顯示自我效能較高的女性愈傾向執行乳房自我檢查行為。

影響女性執行乳房自我檢查行為的修正因素

本研究結果顯示年齡>60歲及<20歲的女性其執行率較其它年齡層的女性較低，與澳門[31]、國內[7]以及其它地區[19-22][29]的研究相約，其原因為澳門女性在從前社會接受教育的機會低，以致其文盲率達40.3% [33]。而目前澳門各中小學尚未推行乳房自我檢查行為或防癌的衛生教育講座[34]，這都與其獲得的知識缺乏有關，故在推行健康教育時，必須針對這批人群，建議由澳門衛生局、教青局、老人中心或長者書院合辦，於各長者日間護理中心或中小學及大專院校舉行相關的衛生教育，以推廣實施乳房自我檢查行為。

並且從研究結果來看，未婚、未生育、未停經的女性其執行率偏低，澳門[31]，及國外[23][32]的研究相同，就郭瑛等[35]研究指出澳門已婚的女性乳癌篩檢認知高於未婚者，其可能與澳門衛生中心提供免費的產前及產後檢查，在候診期間實施女性的衛生教育講座有關[36]。利用Logistic強制回歸分析發現曾停經是未停經的女性3.944倍，可見此為澳門女性執行乳房自我檢查行為的重要影響因素之一，李從業等[37]的研究指出月經不規則的老師在乳房自我檢查態度和信念的得分愈高，這可能由於其月經不規則，更加關注自身健康有關，由於國內、外均無月經狀況與乳房自我檢查行為關係的資料，因此，這個發現仍有待進一步探討。

本研究結果指出曾接受衛生教育的女性是未接受過的5.366倍，這與國外的研究相若[22][32]，SoyerMT等[38]指出曾接受乳房自我檢查行為教育的女性其執行率有所提高的結果相符，故澳門各衛生中心的健康教育講座應將乳房自我檢查行為衛教內容列入每月的講題內，並且在醫院的門診候診室定期進行相關衛教，並配合澳門的婦女團體，以增加女性獲得相關知識的途徑。

澳門女性居住地區不同，依其執行情況由高至低為氹仔地區、塔石、筷子基、黑沙環等，最低為海傍區，其原因可能為氹仔區具最多學位課程的人口，其次為塔石、黑沙環以及筷子基區[33]，而董沛等[39]的研究指出所住地區的衛生服務便利性及文化程度都會影響乳房自我檢查行為的因素，而澳門尚未有居住地與乳房自我檢查行為相關的資料，因此，這個發現仍有待進一步探討。

研究限制

本研究之限制為方便取樣，故研究之結果未能有效代表全澳女性。同時為自填問卷，故未能客觀測量其乳房自我檢查行為，以及本研究利用健康信念模式作為研究架構，故其未包括的相關因素，未能進行探討，同時此次的研究對象為能閱讀中文的女性，故未能閱讀中文的女性未能列入本次研究對象範圍之內。

結論

總結本研究之結果女性的定期執行率及自我罹患乳癌的認知偏低，自覺障礙性、自我效能、居住地不同、曾停經、曾接受相關健康教育的女性均會影響女性執行乳房自我檢查行為，雖然對女性定期執行乳房自我檢查行為仍存在爭議，但澳門乳癌的最年輕發病個案為<20歲，同時大部份的女性診斷為乳癌時都較晚期，並且澳門只有一間公立醫院及兩間私立醫院，公立醫院排期檢查輪候時間長，私立醫院檢查也需要一定的費用，故澳門實有必要廣泛地推行乳房自我檢查，作為女性對關注自身狀況的一個健康行為。

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表 1：研究對象的分佈情形（n =733）

	n	%		n	%
年齡			**個人每月收入**		
<20	7	1.0%	沒有	189	25.8%
20-29	146	19.9%	≦5000元	91	12.4%
30-39	128	17.5%	5001-14999元	293	40.0%
40-49	162	22.1%	15000-24999元	118	16.1%
50-59	198	27.0%	25000-34999元	34	4.6%
>60	92	12.6%	≧35000元	8	1.1%
婚姻狀況			**所屬衛生中心**		
未婚	204	27.8%	塔石	213	29.1%
已婚	504	68.8%	筷子基	179	24.4%
其他	25	3.4%	海傍	78	10.6%
			黑沙環	119	16.2%
生育情況			風順堂	85	11.6%
未曾生育	217	29.60%	氹仔	50	6.8%
曾生育	516	70.40%	路環	9	1.2%
停經狀況			**居住澳門年期**		
未停經	430	58.7%	<7年	114	15.6%
曾停經	44	6.0%	≧7年	619	84.4%
已停經	259	35.3%			
			是否曾患有乳房疾病		
宗教信仰			否	672	91.7%
沒有	508	69.30%	是	61	8.3%
有	225	30.70%			
			周圍親近的家人曾患有乳癌		
職業			否	574	78.3%
商貿業	38	5.2%	是	88	12.0%
醫療業	41	5.6%	不清楚	71	9.7%
教育業	143	19.5%			
酒店餐飲業	15	2.0%	**周圍親近的朋友曾患有乳癌**		
博彩及娛樂業	39	5.3%	否	413	56.3%
家庭主婦	223	30.4%	是	206	28.1%
其他	234	31.9%	不清楚	114	15.6%
教育程度			**曾否接受過有關”乳房自我檢查”衛生教育**		
小學或以下	128	17.4%			
中學	354	48.3%	否	331	45.2%
大學	233	31.8%	是	403	54.8%
碩士或以上	18	2.5%			

表 2：研究對象的健康信念水平（n =733, x±s）

	條目數	總分	各維度平均得分	排序
健康信念總得分	31	97.8±10.7		
自覺利益性認知　Perceived benefits	6	21.45±4.63	3.58±0.16	1
行動線索　Cue to action	5	16.67±3.59	3.33±0.16	2
自我效能　Self-Efficacy	4	13.27±2.72	3.32±0.25	3
自覺嚴重性認知　Perceived severity	5	16.20±3.41	3.24±0.43	4
自覺罹患性認知　Perceived susceptibility	4	11.2.±2.44	2.78±0.15	5
自覺障礙性認知　Perceived barriers	7	19.05±4.42	2.72±0.26	6

表 3：研究對象的健康信念各條目得分（n =733, x±s）

	各維度平均得分	排序
自覺罹患性認知　Perceived susceptibility		
19. 我覺得我的生活習慣很健康，不會罹患乳癌。	2.94±0.943	1
13. 我覺得在我生命中某時期可能會罹患乳癌。	2.86±0.965	2
1. 我覺得我可能會罹患乳癌。	2.73±1.053	3
7. 在未來幾年內，我罹患乳癌的機率很高。	2.6±1.026	4
自覺嚴重性認知　Perceived severity		
14. 罹患乳癌會增加家人負擔。	3.65±1.114	1
20. 罹患乳癌會影響學業/ 事業前途。	3.44±1.072	2
8. 罹患乳癌會降低生活品質。	3.38±1.082	3
2. 罹患乳癌會影響我和親密伴侶（丈夫、男友）的關係。	3.21±1.092	4
25. 乳癌是不治之症。	2.53±1.047	5
自覺利益性認知　Perceived benefits		
3. 每月定期做乳房自我檢查能早期發現乳房週邊組織的變化。	3.75±1.040	1
15. 早期發現乳房疾病，可以延長我的生命。	3.69±1.139	2
26. 相對給醫生檢查，乳房自我檢查更能提早發現乳房異常。	3.64±0.994	3
9. 進行乳房自我檢查能觀察到自己身體的變化。	3.63±0.962	4
21. 預防乳癌即我有自我保護的能力。	3.43±0.959	5
29. 乳房自我檢查可以自己在家裡做，不需到醫療機構，不需要金錢，很便利。	3.33±1.087	6
自覺障礙性認知　Perceived barriers		
16. 我常忘記做乳房自我檢查。	3.28±1.054	1
22. 我覺得要準備一獨立的房間做乳房自我檢查很困難。	2.75±1.064	2
10. 我工作繁忙，無時間做乳房自我檢查。	2.70±1.027	3
4. 我家務繁忙，無時間做乳房自我檢查。	2.66±1.015	4
27. 做乳房自我檢查令我很尷尬。	2.61±1.027	5
31. 醫生定期為我做乳房檢查，故不需作乳房自我檢查。	2.56±1.008	6

	各維度平均得分	排序
30. 朋友或家人知道我做乳房自我檢查會覺得我很奇怪。	2.48±0.933	7
行動線索　Cue to action		
5. 我從大眾媒體（包括電視、收音機、報章雜誌、網路）獲得定期乳房自我檢查的相關資訊。	3.53±0.998	1
11. 我從醫療機構（包括醫護人員、衛教單張、宣傳海報）獲得定期執行乳房自檢查的衛教資訊。	3.47±1.010	2
23. 朋友會告知我定期執行乳房自我檢查的好處。	3.30±0.937	3
28. 我身體健康檢查有異常，故有需要定期執行乳房自我檢查。	3.19±1.006	4
17. 家人會告知我定期執行乳房自我檢查的好處。	3.18±0.987	5
自我效能　Self-Efficacy		
18. 假使乳房自我檢查結果是異常的，我也能面對，並尋求醫護人員的協助。	3.63±0.987	1
24. 我有信心能夠養成定期做乳房自我檢查的習慣。	3.40±0.896	2
6. 我能夠正確執行乳房自我檢查步驟。	3.17±1.001	3
12. 在乳房自我檢查時，我有能力分辨出異常腫塊。	3.08±0.982	4

表 4：健康信念水平與乳房自我檢查行為差異性（n =733, x±s）

	執行乳房自我檢查(BSE)					
	是 (Yes) n =565		否(No) n =168		t	ρ
自覺罹患性認知　Perceived susceptibility	11.03	(2.490)	11.45	(2.261)	-1.950	0.052
1. 我覺得我可能會罹患乳癌。	2.70	(1.063)	2.80	(1.018)	-1.007	0.314
7. 在未來幾年內，我罹患乳癌的機率很高。	2.57	(1.022)	2.70	(1.037)	-1.444	0.149
13. 我覺得在我生命中某時期可能會罹患乳癌。	2.83	(0.968)	2.98	(0.947)	-1.747	0.081
19. 我覺得我的生活習慣很健康，不會罹患乳癌。	2.93	(0.943)	2.98	(0.947)	-0.567	0.571
自覺嚴重性認知　Perceived severity	16.23	(3.37)	16.11	(3.57)	0.413	0.684#
2. 罹患乳癌會影響我和親密伴侶（丈夫、男友）的關係	3.21	(1.110)	3.19	(1.032)	0.237	0.813
8. 罹患乳癌會降低生活品質。	3.42	(1.075)	3.24	(1.096)	1.930	0.054
14. 罹患乳癌會增加家人負擔。	3.69	(1.113)	3.52	(1.111)	1.764	0.078
20. 罹患乳癌會影響學業/ 事業前途。	3.45	(1.075)	3.40	(1.062)	0.475	0.635
25. 乳癌是不治之症。	2.46	(1.027)	2.76	(1.085)	-3.262	0.001**
自覺利益性認知　Perceived benefits	21.731	(4.669)	20.535	(4.389)	2.953	0.000#**
3. 每月定期做乳房自我檢查能早期發現乳房週邊組織的變化。	3.82	(1.016)	3.50	(1.083)	3.441	0.001**
9. 進行乳房自我檢查能觀察到自己身體的變化。	3.69	(0.959)	3.42	(0.945)	3.187	0.001**
15. 早期發現乳房疾病，可以延長我的生命。	3.72	(1.152)	3.58	(1.091)	1.334	0.183
21. 預防乳癌即我有自我保護的能力。	3.47	(0.952)	3.27	0.969)	2.437	0.015*
26. 相對給醫生檢查，乳房自我檢查更能提早發現乳房異常。	3.66	(1.013)	3.55	(0.927)	1.220	0.223
29. 乳房自我檢查可以自己在家裡做，不需到醫療機構，不需要金錢，很便利。	3.37	(1.112)	3.21	(0.990)	1.784	0.075

自覺障礙性認知　Perceived barriers	18.502	(4.491)	20.869	(3.639)	6.993	0.000#**
4. 我家務繁忙，無時間做乳房自我檢查。	2.56	(0.999)	3.02	(0.988)	5.255	0.000**
10. 我工作繁忙，無時間做乳房自我檢查。	2.61	(1.027)	3.02	(0.963)	4.799	0.000**
16. 我常忘記做乳房自我檢查。	3.22	(1.068)	3.47	(0.984)	2.801	0.005**
22. 我覺得要準備一獨立的房間做乳房自我檢查很困難。	2.67	(1.048)	3.02	(1.075)	3.785	0.000**
27. 做乳房自我檢查令我很尷尬。	2.51	(1.012)	2.97	(1.000)	5.234	0.000**
30. 朋友或家人知道我做乳房自我檢查會覺得我很奇怪。	2.43	(0.948)	2.63	(0.866)	2.342	0.019**
31. 醫生定期為我做乳房檢查，故不需作乳房自我檢查。	2.51	(0.999)	2.75	(1.019)	2.724	0.007*
行動線索　Cue to action	16.79	(3.38)	16.26	(3.23)	1.796	0.031#*
5. 我從大眾媒體（包括電視、收音機、報章雜誌、網路）獲得定期乳房自我檢查的相關資訊。	3.56	(1.012)	3.42	(0.945)	1.581	0.114
11. 我從醫療機構（包括醫護人員、衛教單張、宣傳海報）獲得定期執行乳房自檢查的衛教資訊。	3.55	(1.005)	3.20	(0.980)	4.030	0.000**
17. 家人會告知我定期執行乳房自我檢查的好處。	3.16	(1.007)	3.22	(0.918)	-0.674	0.501
23. 朋友會告知我定期執行乳房自我檢查的好處。	3.34	(0.940)	3.19	(0.922)	1.773	0.077
28. 我身體健康檢查有異常，故有需要定期執行乳房自我檢查。	3.18	(1.024)	3.23	(0.948)	-0.629	0.530
自我效能　Self-Efficacy	13.56	(2.75)	12.31	(2.37)	5.762	0.000#**
6. 我能夠正確執行乳房自我檢查步驟。	3.26	(0.982)	2.84	(0.999)	4.899	0.000**
12. 在乳房自我檢查時，我有能力分辨出異常腫塊。	3.13	(0.984)	2.89	(0.957)	2.926	0.004*
18. 假使乳房自我檢查結果是異常的，我也能面對，並尋求醫護人員的協助。	3.70	(0.980)	3.41	(0.981)	3.329	0.001*
24. 我有信心能夠養成定期做乳房自我檢查的習慣。	3.46	(0.898)	3.17	(0.855)	3.808	0.000**
健康信念模式總得分	**97.85**	**(10.64)**	**97.54**	**(10.74)**	**-0.333**	**0.739**

**p<0.001，*p<0.05

#為非正態分佈，秩和序檢驗（Mann-Whitney Test）p值

表 5：健康信念的Logistic回歸分析 （n =733）

自變項	OR	p	95% CI
自覺罹患性認　Perceived susceptibility	1.011	0.788	(0.932 to 1.098)
自覺嚴重性認知　Perceived severity	1.030	0.355	(0.967 to 1.098)
自覺利益性認知　Perceived benefits	0.962	0.193	(0.908 to 1.020)
自覺障礙性認知　Perceived barriers	0.890	0.000**	(0.847 to 0.936)
行動線索　Cue to action	0.931	0.055	(0.865 to 1.002)
自我效能　Self-Efficacy	1.228	0.000**	(1.111 to 1.357)
總分	1.003	0.739	(0.987 to 1.019)

**p<0.001，*p<0.05

表 6：修正因素與乳房自我檢查行為差異性（n =733, x±s）

自變量		執行乳房自我檢查行為				χ^2	p
		是n =565(77.1%)		否n =168(22.9%)			
年齡	< 20	4	(57.1%)	3	(42.9%)	35.548**	0.00
	20 - 29	88	(60.3%)	58	(39.7%)		
	30 - 39	97	(75.8%)	31	(24.2%)		
	40 - 49	136	(84%)	26	(16%)		
	50 - 59	167	(84.3%)	31	(15.7%)		
	≧ 60	73	(79.3%)	19	(20.7%)		
宗教信仰	沒有	390	(76.8%)	118	(23.2%)	0.089	0.765
	有	175	(77.8%)	50	(22.2%)		
職業	商貿業	32	(84.2%)	6	(15.8%)	3.699	0.717
	醫療業	35	(85.4%)	6	(14.6%)		
	教育業	110	(76.9%)	33	(23.1%)		
	酒店餐飲業	11	(73.3%)	4	(26.7%)		
	博彩及娛樂業	28	(71.8%)	11	(28.2%)		
	家庭主婦	172	(77.1%)	51	(22.9%)		
	其他	177	(75.6%)	57	(24.4%)		
教育程度	小學或以下程度	98	(76.6%)	30	(23.4%)	4.903	0.179
	中學	284	(802.2%)	70	(19.8%)		
	大學	171	(73.4%)	62	(26.6%)		
	碩士或以上	12	(66.7%)	6	(33.3%)		
個人每月收入	沒有	141	(74.6%)	48	(25.4%)	3.287	0.656
	≦5000元	70	(76.9%)	21	(23.1%)		
	5001-14999元	225	(76.8%)	68	(23.2%)		
	15000-24999元	93	(78.8%)	25	(21.2%)		
	25000-34999元	30	(88.2%)	4	(11.8%)		
	≧35000元	6	(75.0%)	2	(25.0%)		
居住地區	塔石	176	(82.6%)	37	(17.4%)	12.104	0.060
	筷子基	133	(74.3%)	46	(25.7%)		
	海傍	53	(67.9%)	25	(32.1%)		
	黑沙環	90	(75.6%)	29	(24.4%)		
	風順堂	62	(72.9%)	23	(27.1%)		
	氹仔	43	(86.0%)	7	(14.0%)		
	路環	8	(88.9%)	1	(11.1%)		
居住澳門年期	<7年	86	(76.1%)	27	(23.9%)	0.365	0.833
	≧7年	478	(77.2%)	141	(22.8%)		

**p<0.001，*p<0.05

	自變量	執行乳房自我檢查行為				χ^2	p
		是n =565(77.1%)		否n =168(22.9%)			
婚姻狀況	未婚	129	(63.2%)	75	(36.8%)	30.708**	0.00
	已婚	415	(82.3%)	89	(17.7%)		
	其他	21	(84%)	4	(16%)		
生育情況	未曾生育	137	(63.1%)	80	(36.9%)	33.940**	0.00
	曾生育	428	(82.9%)	88	(17.1%)		
停經狀況	未停經	310	(72.1%)	120	(27.9%)	15.975**	0.00
	曾停經	40	(90.9%)	4	(9.1%)		
	已停經	215	(83%)	44	(17%)		
是否曾患有乳房疾病	否	513	(76.3%)	159	(23.7%)	2.511	0.113
	是	52	(85.2%)	9	(14.8%)		
周圍親近的家人曾患有乳癌	否	434	(75.6%)	140	(24.4%)	4.138	0.126
	是	75	(85.2%)	13	(14.8%)		
	不清楚	56	(78.9%)	15	(21.1%)		
周圍親近的朋友曾患有乳癌	否	302	(73.1%)	111	(26.9%)	10.084*	0.006
	是	174	(84.5%)	32	(15.5%)		
	不清楚	89	(78.1%)	25	(21.9%)		
曾否接受過有關“乳房自我檢查”衛生教育	否	202	(61.0%)	129	(39.0%)	88.041**	0.00
	是	363	(90.3%)	39	(9.7%)		

**p<0.01，*p<0.05

表 7：修正因素與乳房自我檢查行為的Logistic回歸分析（n =733）

變項	OR	p	95% C.I.		
			Lower		Upper
年齡		0.577			
< 20	1			參照組	
20 - 29	0.684	0.677	0.114	to	4.104
30 - 39	1.086	0.932	0.166	to	7.082
40 - 49	1.475	0.688	0.222	to	9.802
50 - 59	1.163	0.884	0.154	to	8.786
≧ 60	1.044	0.969	0.125	to	8.700
宗教信仰					
沒有	1			參照組	
有	0.834	0.434	0.528	to	1.315
職業		0.788			
商貿業	1			參照組	
醫療業	0.980	0.978	0.233	to	4.132
教育業	0.599	0.366	0.197	to	1.821
酒店餐飲業	0.799	0.798	0.144	to	4.450
博彩及娛樂業	0.507	0.305	0.138	to	1.860
家庭主婦	0.483	0.245	0.141	to	1.647
其他	0.754	0.605	0.258	to	2.201
教育程度		0.468			
小學或以下程度	1			參照組	
中學	1.367	0.318	0.741		2.523
大學	1.935	0.123	0.836		4.482
碩士或以上	1.381	0.646	0.348		5.477
個人每月收入		0.480			
沒有	1			參照組	
≦5000元	1.449	0.353	0.662	to	3.171
5001-14999元	1.248	0.566	0.586	to	2.657
15000-24999元	1.890	0.156	0.784	to	4.558
25000-34999元	2.333	0.229	0.586	to	9.281
≧35000元	0.535	0.525	0.078	to	3.667
居住地區		0.117			
海傍	1			參照組	
風順堂	1.503	0.309	.686	to	3.293
筷子基	2.335	0.016*	1.174	to	4.642
黑沙環	2.109	0.046*	1.013	to	4.390
塔石	2.356	0.014*	1.192	to	4.657
氹仔	3.442	0.022*	1.195	to	9.912

變項	OR	p	95% C.I.		
			Lower		Upper
路環	4.818	0.196	0.443	to	52.368
居住澳門年期					
<7年	1			參照組	
≧7年	0.882	0.666	0.498	to	1.561
**p<0.00，*p<0.05					
婚姻狀況		0.957			
未婚	1			參照組	
已婚	1.074	0.873	0.447	to	2.583
其他	1.250	0.768	0.284	to	5.501
生育狀況					
未曾生育	1			參照組	
曾生育	2.310	0.073	0.926	to	5.764
停經狀況		0.072			
未停經	1			參照組	
曾停經	3.944	0.030*	1.139	to	13.659
已停經	2.034	0.120	0.830	to	4.983
是否曾患有乳房疾病					
否	1			參照組	
是	1.766	0.195	0.748	to	4.169
周圍親近的家人曾患有乳癌		0.341			
否	1			參照組	
是	1.386	0.400	0.648	to	2.964
不清楚	1.738	0.184	0.769	to	3.928
周圍親近的朋友曾患有乳癌		0.415			
否	1			參照組	
是	1.142	0.638	0.657	to	1.984
不清楚	0.693	0.300	0.347	to	1.386
曾否接受過有關“乳房自我檢查”衛生教育					
否	1			參照組	
是	5.366	0.000**	3.499	to	8.230

**p<0.01，*p<0.05

表 8：健康信念百分比分佈（n =733）

	非常不同意	不同意	無意見	同意	非常同意
自覺罹患性認知　Perceived susceptibility	9.1%	32.7%	32.9%	21.4%	3.9%
1. 我覺得我可能會罹患乳癌。	11.3%	34.5%	28.8%	21.0%	4.4%
7. 在未來幾年內，我罹患乳癌的機率很高。	13.8%	35.5%	32.2%	14.5%	4.1%
13. 我覺得在我生命中某時期可能會罹患乳癌。	7.8%	28.4%	36.3%	25.0%	2.6%
19. 我覺得我的生活習慣很健康，不會罹患乳癌。	3.5%	32.6%	34.5%	25.0%	4.4%
自覺嚴重性認知　Perceived severity	5.8%	28.0%	13.5%	41.5%	11.1%
2. 罹患乳癌會影響我和親密伴侶（丈夫、男友）的關係 。	5.5%	26.2%	19.2%	40.4%	8.7%
8. 罹患乳癌會降低生活品質。	4.2%	22.9%	14.6%	47.2%	11.1%
14. 罹患乳癌會增加家人負擔。	5.0%	16.1%	7.0%	52.5%	19.4%
20. 罹患乳癌會影響學業/ 事業前途。	4.0%	21.3%	13.5%	49.4%	11.9%
25. 乳癌是不治之症。	10.2%	53.8%	13.2%	18.1%	4.6%
自覺利益性認知　Perceived benefits	3.1%	17.6%	12.9%	51.2%	15.1%
3. 每月定期做乳房自我檢查能早期發現乳房週邊組織的變化。	3.0%	14.2%	9.1%	52.3%	21.4%
9. 進行乳房自我檢查能觀察到自己身體的變化。	2.7%	14.3%	12.3%	58.7%	12.0%
15. 早期發現乳房疾病，可以延長我的生命。	5.3%	15.1%	8.0%	48.6%	22.9%
21. 預防乳癌即我有自我保護的能力。	2.2%	19.2%	20.3%	50.3%	7.9%
26. 相對給醫生檢查，乳房自我檢查更能提早發現乳房異常。	2.2%	16.5%	11.6%	55.0%	14.7%
29. 乳房自我檢查可以自己在家裡做，不需到醫療機構，不需要金錢，很便利。	3.3%	26.3%	16.1%	42.6%	11.7%
自覺障礙性認知　Perceived barriers	7.3%	46.8%	16.5%	25.5%	4.0%
4. 我家務繁忙，無時間做乳房自我檢查。	7.9%	47.5%	17.7%	24.1%	2.7%
10. 我工作繁忙，無時間做乳房自我檢查。	7.6%	46.4%	17.2%	25.9%	2.9%
16. 我常忘記做乳房自我檢查。	4.0%	26.3%	14.7%	47.7%	7.2%
22. 我覺得要準備一獨立的房間做乳房自我檢查很困難。	6.5%	47.1%	17.1%	23.7%	5.6%
27. 做乳房自我檢查令我很尷尬。	7.2%	53.8%	13.6%	21.3%	4.1%
30. 朋友或家人知道我做乳房自我檢查會覺得我很奇怪。	8.9%	54.6%	18.6%	16.0%	2.0%
31. 醫生定期為我做乳房檢查，故不需作乳房自我檢查。	8.9%	52.0%	16.4%	19.4%	3.4%
行動線索　Cue to action	3.0%	22.2%	20.6%	46.8%	7.4%
5. 我從大眾媒體（包括電視、收音機、報章雜誌、網路）獲得定期乳房自我檢查的相關資訊。	3.1%	18.4%	10.2%	58.8%	9.4%
11. 我從醫療機構（包括醫護人員、衛教單張、宣傳海報）獲得定期執行乳房自檢查的衛教資訊。	2.9%	20.6%	12.6%	54.7%	9.3%
17. 家人會告知我定期執行乳房自我檢查的好處。	3.7%	24.0%	29.5%	36.6%	6.3%
23. 朋友會告知我定期執行乳房自我檢查的好處。	1.4%	23.3%	24.8%	44.6%	5.9%
28. 我身體健康檢查有異常，故有需要定期執行乳房自我檢查。	4.0%	24.7%	25.9%	39.2%	6.3%
自我效能　Self-Efficacy	2.1%	24.5%	20.2%	45.9%	7.3%
6. 我能夠正確執行乳房自我檢查步驟。	2.9%	29.1%	22.1%	40.5%	5.5%
12. 在乳房自我檢查時，我有能力分辨出異常腫塊。	1.8%	35.1%	21.0%	37.9%	4.2%
18. 假使乳房自我檢查結果是異常的，我也能面對，並尋求醫護人員的協助。	3.1%	14.5%	11.6%	57.7%	13.1%
24. 我有信心能夠養成定期做乳房自我檢查的習慣。	0.8%	19.2%	25.9%	47.6%	6.4%

宋卉教授

廣東食品藥品職業學院國際交流學院院長，於汕頭大學修畢藥理學博士專業學位，在廣東食品藥品職業學院任教多年，亦身兼多個機構的重要職位：健康管理專業創始人/帶頭人、第三批廣東省「千百十人才培養工程」校級培養對象，廣東省職業技能（健康管理）鑒定專家、廣東省藥品價格評審專家、廣東省科技廳科技計劃項目評審專家、廣東省老年保健協會生物治療專業委員會委員、廣東省藥理學會臨床藥理專業委員會委員、香港百本健康管理研究中心主任及廣州同佳國際健康管理公司（香港上市公司）顧問。現主要從事廣東食品藥品職業學院國際交流學院行政及管理工作和院校辦學研究。

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高職教育健康管理專業的發展現狀與前景展望

一、健康產業人才需求旺盛

第六次全國人口普查資料顯示，我國平均生育率只有1.4到1.5的水平，2014年底中國60周歲以上人口達至2.12億，佔總人口的15.5%；65周歲以上人口達至1.38億，佔總人口的10.1%；而其中非健康狀態的比例為50.1%，已經進入進程逐步加快的老齡化社會，且慢性病對社會民眾的危害日益增大，佔用了大量的醫療衛生資源，傳統醫療服務模式面臨巨大壓力，健康教育及健康指導重要性日益增長。《國務院關於促進健康服務業發展的若干意見》中明確指出：加大人才培養和職業培訓力度；支持高等院校開設健康服務業相關學科專業、引導有關高校合理確定相關專業人才培養規模；規範並加快培養健康管理師等從業人員。教育部等九部委頒佈了《關於加快推進養老服務業人才培養的意見》，要求加快促進養老服務相關專業教育體系建設，擴大養老服務職業教育人才規模與層次，引導和鼓勵職業院校增設健康管理等重點專業。這對於緩解我國健康服務業人才緊缺狀況，具有重要的現實意義。

健康管理是基於個人健康檔案基礎上的個體化健康事務管理服務，它是建立在現代生物醫學和資訊化管理技術模式上，從社會、心理、生物的角度來對每個人進行全面的健康保障服務，說明、指導人們成功有效地把握與維護自身的健康，防止疾病發生與發展，從而在有效保持、促進健康的同時也控制醫療費用的增長。健康管理師在歐美一些發達國家早已家喻戶曉。以美國為例，截至2012年，美國已有31萬專業健康管理師，他們在不同機構工作，如社區、養老院、康復中心、醫院等。預計至2022年，美國健康管理師數量將增長23%，增加7.3萬多人。相關統計顯示，大約每10個美國人就有7個享有健康管理服務；在我國，按照每5,000人配備一名健康管理師來計算，全國需要26萬名健康管理師，而目前全國經過正規、系統學習並取得健康管理師的從業人員不到2,000人，能夠勝任健康管理服務的高品質健康管理人才嚴重不足，同時大量不具備專業素養甚至缺乏職業道德的人湧入業內「淘金」，導致隊伍良莠不齊，服務品質難以保證。因此，旺盛的市場需求和嚴重的人才匱乏之間的矛盾，已經嚴重影響到我國的健康服務業發展。而培養大批高素質的健康管理人才已成為高校健康服務專業發展的當務之急。

二、健康管理專業人才培養概況

- 專業發展沿革及培養規模

截至2015年國家教育部本科專業目錄中，仍無健康管理專業，所有本科招生資訊顯示，健康管理全部隸屬於某個專業的專業方向。如杭州師範大學醫學院、海南醫學院、貴州醫科大學、廣西師範大學職業技術師範學院、浙江中醫藥大學、遼寧醫學院等大學招收公共事業管理專業（健康管理方向），且多為近兩年開設。

大專層次院校中，廣東食品藥品職業學院2011年率先向教育部申請設立健康管理專業，次年納入全國高考高職招生目錄並正式招生；其他開設健康管理專業（或方向）的學院包括浙江醫學高等專科學院、寧波衛生職業技術學院、廣州工商學院公共事務管理（食品安全與健康管理方向）、嶺南職業技術學院醫學營養專業（健康管理方向）和四川國際標榜職業學院等，6所高校培養規模每年不足2,000人。

- 健康管理專業培養目標

健康管理專業人才培養，須緊扣《健康管理師國家職業標準》要求，掌握現代健康管理理念；熟悉資訊化時代健康管理的評估方法、管理體系和運作規律；掌握健康管理必備的理論和實踐要點；掌握必備的健康管理技能，在畢業時達到健康管理師執證能力，勝任健康管理相關的企業、事業單位內部的健康管理與服務工作。

在這個基本的目標基礎上，各個院校根據自身的辦學基礎和專業群特點，突出了本校健康管理專業特色。如杭州師範大學醫學院擁有「治未病與健康管理」服務國家特殊需求博士人才培養專案，具有「公共管理學」一級學科碩士學位授予權，「健康管理學」、「社會醫學與衛生事業管理」等二級學科碩士學位授予權，較重視醫學基礎。海南醫學院的公共事業管理專業（健康管理方向），人才培養目標強調在醫學基礎上，融入心理學、旅遊醫學以及熱帶醫學和養生保健知識，強調相關專業在健康管理領域的應用能力[1]。廣州工商學院的公共事務管理（食品安全與健康管理方向）則突出營養配餐、食療保健、保健食品行銷以及健康產業服務、行銷和管理等工作技能的培養。

廣東食品藥品職業學院的健康管理專業，由國際學院引入英國、澳洲、香港等國家和地區健康管理師培養的經驗，融合我國傳統醫藥人才培養精髓，以「全人教育」理念為引領，培養學生不僅具有健康管理、醫藥的專業知識和技能等硬實力，還增加了中醫中藥模組、商務通識模組，更融入了國際化培養特色，增設了針對性培養學生人文素養及持續發展能力軟實力的人文發展模組。

三、健康管理專業進一步發展的制約因素

健康管理專業開設時間雖然不長，但是也曝露出不少未來發展的障礙。主要來自社會心理、行業准入制度、專業教學組織等幾個方面。

- 社會心理方面

我國由於經濟和社會發展水平與發達國家還有較大差距，社會民眾受教育程度還較低，對健康管理理念的接受度仍有待提高。目前大多數人沒聽說過健康管理，「有病才上醫院，沒病不重預防」的現象普遍存在，購買專業系統的健康管理服務的人鳳毛麟角。儘管健康管理公司雨後春筍般大量出現，但從事與健康管理內涵描述相符的企業非常少，多為健康管理鏈條上的一個或幾個點，甚至不乏打著健康管理旗號進行虛假保健品銷售的企業，影響了專業畢業生的就業品質。

- 行業准入制度方面

本專業對應的職業資格證書為健康管理師，按照國家職業資格標準，准入門檻為相關專業大專以上方可考取三級健康管理師資格，但社會上存在大量以獲取職業資格為目的的各種培訓班，培養大量速成健康管理師，報名資格未經嚴格審查。在一定程度上，降低了該職業的社會聲譽。

- 專業教學組織方面

全國開設該專業的高校數量稀少，且都是近幾年舉辦，相關的省及全國專業教學指導委員會尚未成立，各校的專業發展中沒有得到相關指導，各校之間缺少交流和溝通平臺，在一定程度上制約了專業的發展，阻礙了建設水準提高。

四、健康管理專業的發展前景

儘管還存在以上制約健康管理專業發展的因素，但由於國家的經濟及戰略部署轉移，以及日益增長的人民健康意識，健康管理產業必將逐漸成為新的經濟增長點，健康管理專業也將隨之飛速發展。現有的健康管理從業人員多為經短期培訓後轉型的醫護人員，或者非涉及醫療專業、甚至社會人員，正規系統的健康管理專業培養管道嚴重缺乏，遠遠無法滿足相關企業單位的用人需求。2015年廣東食品藥品職業學院第一屆畢業生的供求比率達到1：5，數個高速發展中的企業希望接收全部畢業生。因此，大力培養與行業發展特徵相符的健康管理專業人才，應成為相關高校的發展重點[2]。

高職院校應在人才培養方案上體現院校特色和時代特點。在人才培養方案的制定上應該注意與醫學相關專業，如臨床醫學、護理、公共衛生、預防醫學等專業區分。廣東食品藥品職業學院的健康管理專業人才培養目標是掌握一定的醫學和公共衛生背景知識和專業技能，具有良好人文素養和團隊合作精神，掌握健康管理知識和技能流程、能勝任健康管理各項任務的高端服務人才。尤其是在培養過程中引入國際化元素，開拓學生視野，強調人文關懷精神的培育，定能得到較好效果。另外，在「互聯網+」的時代，也應多引導培養學生的互聯網思維，引入相關實訓條件，以滿足眾多健康管理公司的「互聯網+」業務的大量開展而產生的人才需求。

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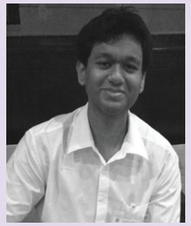

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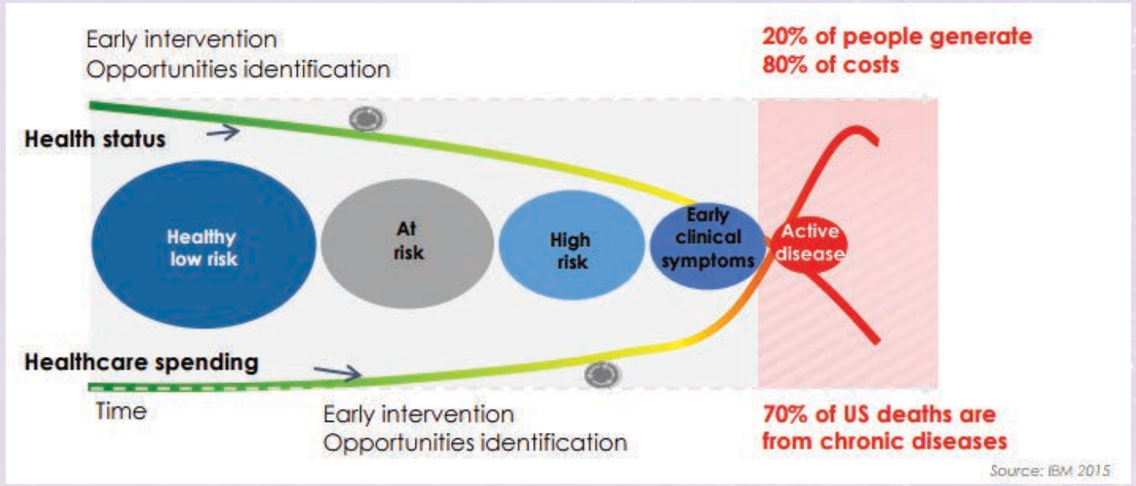
Is digital health feasible?

Why digital health?

In all honesty, "digital health" is a very broad term and entails several different definitions and constituents. It includes but is not limited to innovations such as wearable health devices (such as the fibit), smartphone applications such as the Nike + iPod app and any other such sensor or medical device with unconventional functionalities.

Currently, healthcare costs are rising for both patients and care-givers such as hospitals. Rising costs coupled with the shortage of facilities and experts (such as doctors or physicians) result in an inability to cater to the increasing proportion of diseased patients on a global scale. This is undoubtedly a global issue! Patients suffer from rising costs of care and hospitals, with a lack of facilities and expertise at their disposal, cannot cater to the rising demand and incur losses and higher



costs. Even insurance companies, especially government run insurance firms suffer. For instance, the National Health Insurance (NHI) in Japan was only able to cover 56% of their costs in 2013. And their national healthcare expenditure is forecasted to rise by 3.3% in the next 10 years!

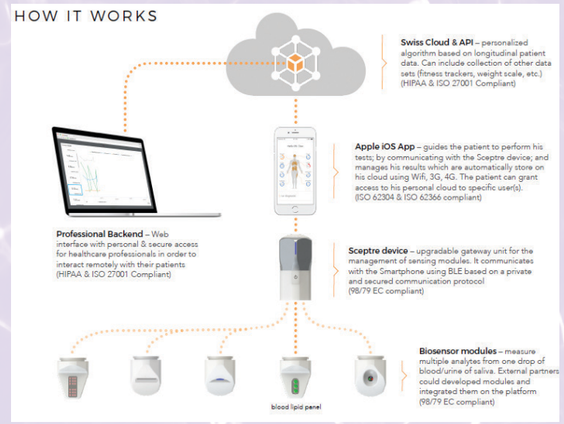
So at this point, you must be thinking that everybody is getting unhealthy and may not receive the appropriate care due to rising costs and lack of resources. To a certain extent that is true, especially in emerging markets such as China and India who have seen drastic increases in diabetic patients for instance, but it is also ironically untrue to a certain extent. In 2015, IBM reported that 20% of the people generate 80% of the costs in the US. In short, a certain amount of unhealthy people fall ill more frequently than others thereby needing care more often than others and generating more costs. This is a significant issue in countries such as Japan, wherein there is no credible infrastructure or provision in place to identify whether a patient needs a check-up or not; hence resulting in the NHI paying out more for patients who might not have needed a check-up but visited the doctor anyways.

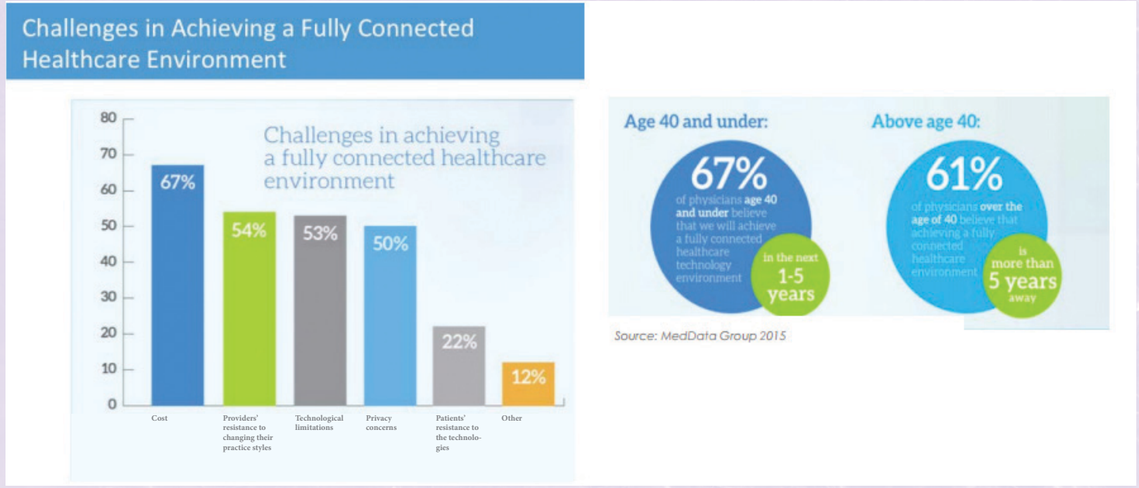
In conclusion, it can be argued that the current system is not optimal given the current circumstances. Digital health solutions can appear to be the solution to this problem. For instance, a wearable device which is connected wirelessly to the patient's doctor can help the doctor gauge whether a patient is healthy and determine whether a check-up is required or not by monitoring his/her vitals. This helps in managing demand for care by prioritizing those in need of care more than others and also saves costs for insurers and patients. Moreover, a credible wearable medical device can help detect symptoms early for the patient enabling them to seek care before it's too late.

Is digital health popular?

Most of the exciting innovations from the world of digital health remain hidden from the public eye. However, innovations such as the Sceptre from Qloudlabs, a Swiss start-up, definitely gives us reason to get excited. In summary, their product aims to simplify the process of obtaining blood coagulation levels of a patient. Typically, it takes several days or even weeks to obtain results post check-up. The team at Qloudlabs identified that post heart surgery, many patients do not reach healthy levels of blood coagulation percentage which is primarily down to the current lengthy procedure which hinders the possibility of frequent monitoring. With the Sceptre, patients can now measure their blood coagulation levels from the convenience of their homes. The device is also connected to the patient's doctor, thereby enabling them to monitor and take action in the case of any emergency.

Sceptre™, introducing the World's first modular POCT medical device





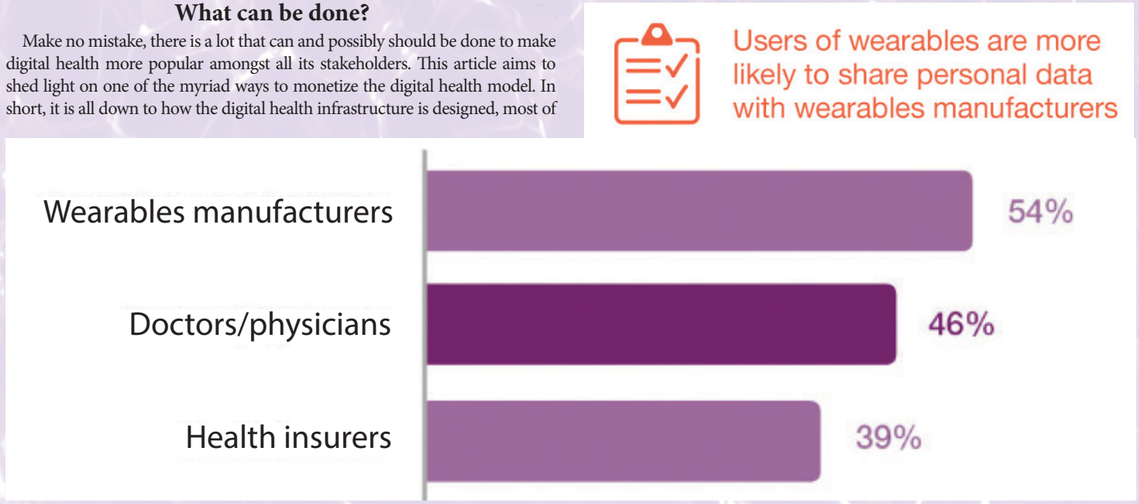
But truth be told, the digital health industry is still very immature. Medical devices irrespective of how innovative they are, need to be infallible and cannot give even the slightest error in their readings and/or measurements. Therefore in order to get approval, wearables generally have to consist of medical grade sensors with high levels of precision and accuracy. Consequently implementing these measures raises the price point of the device which in turn discourages consumers and likewise physicians and other such medical professionals to purchase them. In fact, despite many physicians believing in the possibility of a fully connected healthcare technology environment, 67% of them believe cost is a major challenge to utilize the potential that the world of digital health offers.

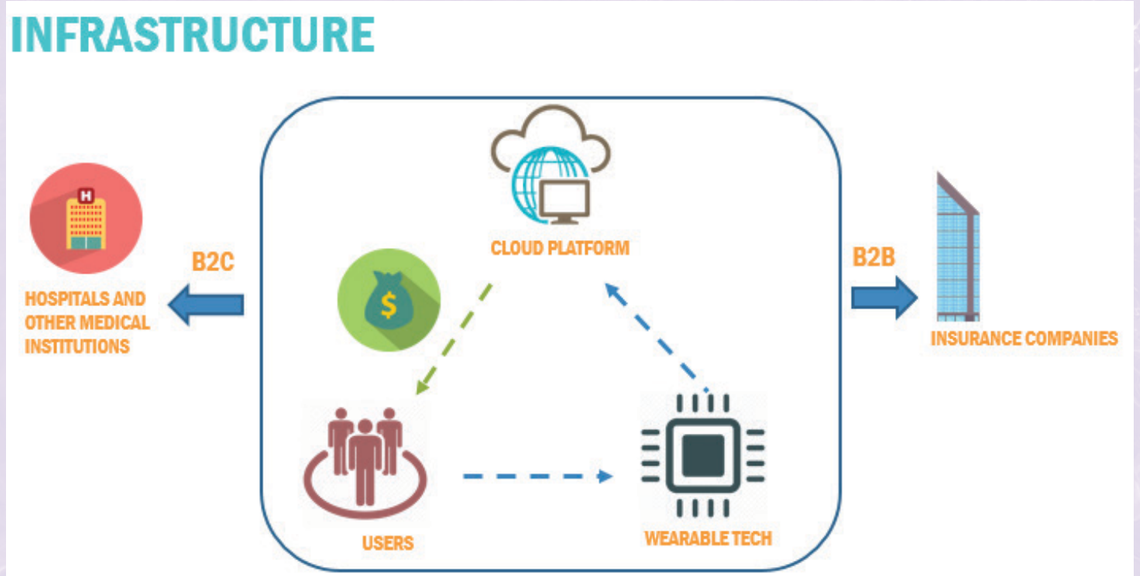
On the plus side, it seems that regulatory bodies are welcoming the prospect of digital health solutions. In the United States, over 190 mobile medical applications were approved and over 350 medical device data systems were approved by the FDA. It's probably safe to conclude that US regulatory path for digital health is well established.

What can be done?

Make no mistake, there is a lot that can and possibly should be done to make digital health more popular amongst all its stakeholders. This article aims to shed light on one of the myriad ways to monetize the digital health model. In short, it is all down to how the digital health infrastructure is designed, most of the devices such as one discussed earlier have wireless connectivity capabilities thereby enabling the involvement of other stakeholders besides the patient. One of the biggest or maybe the biggest concern with the deployment of a digital health infrastructure is privacy and the security of patient data. To achieve a fully connected healthcare technology environment, many stakeholders such as hospitals, insurance companies, manufacturers etc. have access to the patient's medical data and history. Which begs the question, who should be trusted with patient data amongst all these stakeholders? Surprisingly, a consumer survey conducted by Ericsson concluded that people trust the wearable manufacturer more than their own doctor.

From the perspective of the wearables manufacturers, this is definitely positive news. They control and have access to the medical records of each and every one of their users. However, it is prudent to recall that a fully connected healthcare environment should aim to not just benefit the medical device manufacturer.





To emphasize more about how insurance companies can contribute to this infrastructure is definitely interesting. When an insured customer uses wearable technology, the insurance company potentially has access to his/her medical data on a frequent basis. This can enable them to make well informed decisions to gauge the health of their users. Why is this useful? It is no secret that not everybody is equally as healthy as each other, one insured customer might cost more to the insurer if he/she requires more care (claims, reimbursements etc.). With the advent of wearable tech, the insurance company can possibly introduce so called "dynamic" pricing models for customers. Wherein, premium prices can be adjusted depending on the health of each customer. In the United States, Oscar Health Insurance incentivizes its users to become healthier by giving them fitness rewards of up to $240 on their premiums if they agree to use a step tracker. This also introduces the possibility of insurance companies able to increase their consumer satisfaction by personally catering to their needs and introduce more precise premiums (more detailed descriptions essentially) by monitoring long term behavioural models from the medical data obtained from the customers. Although it may seem crazy, but it might be feasible for insurance companies to even enter new markets such as mental illness insurance plans if a credible wearable for mental illness is developed.

In conclusion, this article also aims to emphasize the crucial aspect of educating patients. With an ever increasing shortage of medical experts to cater to the demand of patients needing assistance, digital health solutions can play an important role in educating users. A simple example might be that of an interactive smartphone application such as that of Qloudlabs to let users if their blood coagulation levels are in a safe zone or not, instead of relying on feedback from their doctor.

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Author biographies are limited to 80 words and should appear at the end of text.

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