The theory of body constitution (BC) is the foundation of disease management in Chinese medicine (CM). BC is classified into “healthy”, “sub-health” and “unhealthy” states. A person with “healthy” BC has a balance of body Yin (cold) and Yang (hot). In contrast, an imbalanced state of body Yin and Yang leads to “sub-health” initially. Without prompt diagnosis and appropriate treatment, person with “sub-health” will progress to a disease state, that is, an “unhealthy” BC. BC is formed by congenital factor. However, it can be changed along one’s life time under the influence of acquired factors. In the population of diabetes mellitus (DM), Yin-deficiency, Yang-deficiency and Yin-Yang-deficiency are commonly recognized “unhealthy” BC types. The treatment mode of DM in CM is different from the Western medicine. Syndrome differentiation with BC taken into consideration together, with balancing one’s Yin and Yang is the treatment strategy in CM. In order to regulate “unhealthy” BC, it is necessary to provide certain Yin/Yang enhancing program, such as integration of dietary therapy. The ultimate goal of the intervention is to reduce the disease burden, such as DM-related poor quality of life, stress of homecare givers and healthcare professionals and the rising healthcare cost.

**Keywords:** Chinese medicine; Body constitution; “Unhealthy” body constitution; Diabetes mellitus; Yin-deficiency; Yang-deficiency; Yin-Yang-deficiency

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**Introduction**

In Chinese medicine, treatment variation is based on syndrome differentiation and then treated accordingly with body constitution taken into consideration [1]. The prevalence of diabetes mellitus has been increasing worldwide in both developed and developing countries [2]. In this article, body constitution and diabetes mellitus are reviewed from a perspective of Chinese medicine, covering (1) body constitution in Chinese medicine; (2) diabetes mellitus in Chinese medicine; and (3) body constitution in diabetes mellitus.
in pathology should be applied in clinical studies[5]. In this section, BC is reviewed covering the definition of BC, BC and health status, influential factors of BC and common types of BC in CM.

**Definition of body constitution**

In 1977, Kuang [5-6] proposed the definition of BC based on his clinical practice and experience. He defined human BC as a special state of population or an individual with relative stability in terms of function, structure and metabolism formed during growth, development and aging under the effect of the environment and on the basis of individual heredity [5-6]. Basing on a review of relevant literatures on BC classification, epidemiological studies and clinical practice, Wang [8] defined BC as an integration of congenital and acquired factors exhibiting stability of physical structure, physiological function and psychological state. Obviously, Kuang was referring to BC as physical aspect, while Wang was focusing on both the physical and psychological aspects [9]. Furthermore, Kuang dwelt more on health-related aspect by including metabolism. Metabolism takes charge of food, which is an important element of nutrition therapy in disease management, such as controlling carbohydrates for the stabilization of blood glucose levels in DM management [10]. Other findings have suggested that metabolism was involved in the influence on BC, as evidenced by results showing that 171(85.5%) of 200 patient subjects with a “phlegm-dampness” (sticky and mucous fluid) type of BC were prone to suffering from uncontrolled feelings of hunger with higher food consumption due to higher metabolic rate[11]. Furthermore, males and females are different in BC[12-13]. There is not a standardized definition of BC because CM scholars provide different viewpoints about BC definitions based on individual experiences in clinical practices, literatures and epidemiological studies [3]. Based on the review, BC however, can be comprehended as representing the health status of an individual or a population in terms of physical structure, physiological function, pathological reaction, psychological or mentally stability and metabolism formed during growth, development and aging under the effect of the acquired factors.

**Body constitution and health status**

In CM, health status can be classified as “healthy”, “sub-health” and “unhealthy”[14]. In accordance with the theory of CM, a healthy person has a balance of Yin and Yang [15], thus having a “healthy” BC. If, due to unmanageable physiological and/or psychological stress, this healthy person can no longer keep his or her BC balanced, it will progress into a state of “sub-health” [14], reflecting the body temperature and humidity state with “cold”, “heat”, “dryness” and “dampness” natures of presentations, such as “heat-dampness” (feelings of boiling-hot), “cold-dampness” (feelings of chilling-cold), “heat-dryness” (feelings of burning-hot) or “cold-dryness” (feelings of freezing-dry) and clinical complaints, such as malaise, insomnia and overweight. Without immediate and appropriate treatment to regulate the inner “cold-heat” and “dampness-dryness”, this person will enter a disease state with an “unhealthy” BC. There are four commonly recognized “unhealthy” BC types in contemporary CM [5, 16]. First, person with a Yin-deficiency type of BC has an over excessive body heat and dryness as a result of a depletion of body fluid. Second, Yang-deficiency type of BC occurs in person with an over excessive body fluid and characterized with “cold” and “dampness”. Third, blood-stagnation as a result of slow blood circulation is found in person with a Blood-stasis type of BC. Forth, Phlegm-dampness type of BC is characterized for an inner heat-dampness due to an excessive mucous body fluid.

As discussed earlier in this section, “unhealthy” BC develops in people with “sub-health” if untreated properly. Yin-deficiency is characterized for its “heat”, “dryness” and excess loss of body fluid [17] causing cell and tissue damage leading to inflammation [14]. Hypertension is a typical disease in this “heat-dryness” type of BC [18]. Those with Yang-deficiency, which is a “cold-dampness” type of BC, present with subnormal temperatures and body fluid retention [19], resulting in a disturbance of endocrine functioning [20]. Yang-deficiency can lead to a risk of cancer [21] and hypertension [18]. Subnormal body temperature and humidity give rise to the occurrence of Blood-stasis type of BC with clinical signs and symptoms, such as feelings of numbness over the body, poor blood circulation, cold limbs and purple lips [14, 17]. Persons with Phlegm-dampness type of BC due to high temperature with high humidity have clinical complaints, such as edema, fatigue and poor digestive functions [22]. Without appropriate regulation of these “unhealthy” BC types and awareness of the influential factors of BC, disease risks are likely to be induced.

**Influential factors of body constitution**

BC is a result of congenital factor [23-24], which governs the strength and weakness of a person before and after birth[24-26]. The relationship between the formation of BC and congenital factor was supported in a study by Lo Bin, who reported that a Phlegm-dampness type of BC was related to HLA-B40 while, in the case of obese persons, Phlegm-dampness type of BC presentation was related to HLA-A11 and HLA-B40 [8]. These results demonstrated that inherent immunity was the foundation of BC for obesity with “phlegm-dampness” [23]. Genetic factors play an important role in BC. However,
BC can be changed by acquired factors. These are food intake, emotion, disease, age, geographical factors and Yin-Yang interaction.

**Food intake**

From the perspective of CM, food intake plays an important role in the formation and change of BC. Food of a cold or cool nature influences a “cold-dampness” type of BC while that of a hot or warm nature influences a “heat-dryness” type of BC. There have not been many studies conducted to find the association between BC and food intake from a CM perspective. Yet, Law carried out an investigation of the association between diet and the occurrence of acne over a period of seven days on 155 participants with Yang-deficiency and 167 participants with Yin-deficiency from a CM perspective. After seven days, the results showed that, in the Yang-deficiency group, a higher intake of food from street stalls was less likely to produce clinical acne. Such foods are generally fatty and deep-fried, and considered to be hot in nature. In contrast, those in the Yin-deficiency group are more likely to develop acne when they favor desserts than when they consume dairy or soy products. These desserts are sweet in taste and treated by baking are generally hot in nature. Suen pointed out that over consumption of food with high fat content could induce a Phlegm-dampness type of BC; chilli-hot food was associated with Yin-deficiency type of BC; salty food promoted Blood-stasis and food of a cold or cool nature was associated with a Yang-deficiency type of BC.

**Emotion**

Emotion has an impact on the harmony of psychological and physiological states in a person. In the CM theory, emotion refers to the seven emotions including joy, fright, worry, anxiety, sorrow, fear and anger. Excessive emotions will affect and harm the internal organs in a human body. For instance, joy and fright affect the heart; worry and anxiety affect the spleen/stomach; sorrow affects the lung; fear affects the kidney and anger affects the liver. Excessive emotions is one of the causes of DM; a Yin-deficiency type of BC can be induced due to an “excessive liver fire” (excessive heat in the liver that can cause otitis, red face, dizziness, bitter tastes in the mouth and poor digestion) produced directly by anger alone or indirectly by other emotions. Although scientific evidence of the association between emotions and clinical symptoms is rarely reported, one study found that “anger” had a positive correlation with self-oriented perfectionism (rho=0.23, P < 0.01) and tension or fatigue (rho=0.18, P < 0.05). “Fatigue” means an exhaustion which is a result of burning out brain energy because “anger” is viewed as emotion which triggers part of the fight brain response. From a CM perspective, “fatigue” is, however, found in persons with Yang-deficiency type of BC. Excessive emotions, such as “anger”, can induce an “unhealthy” BC, which is likely to induce disease risks.

**Disease**

Disease can be related to pathological change. BC undergoes changes during a person’s lifetime due to physiological changes. For instance, persons with hypertension are found to have “unhealthy” BCs, including such as severe “heat” in the liver, Yin-deficiency, Yang-deficiency, Yin-Yang-deficiency and integrated Phlegm-dampness and Blood- stasis. People with DM have a Yin-deficiency type of BC as the basis. After a prolonged post diagnosis period, the Yin-deficiency type of BC can be changed further to Yang-deficiency or Yin-Yang-deficiency. These references indicate clearly that BC is changing in persons with chronic diseases.

**Age**

Females over forty-nine are prone to have a Yin-deficiency type of BC due to the declination of blood and vital substances, such as hormone resulting in exhaustion of reproduction system, hypertension and DM. Older persons tend to have Yang-deficiency type of presentations, such as an aversion to cold in all years and cold limbs due to the declination of vital energy resulting in hypertension and lower metabolic rate. As pointed out by McGhee et al, the prevalence of DM in Hong Kong in the older population aged 65 and above was six times that in the younger population aged 18 to 64 in 2003-2004. The numbers of older people who have DM would be expected to increase and to be most at risk of developing Yin-deficiency and Yang-deficiency types of BC.

**Geographical influence**

Geographical influence is one of the factors that can change BC in different populations under different local conditions. For example, Yin-deficiency and Phlegm-dampness are two typical BC types found in Guangxi, China. It is because Guangxi is located near the Asian Pacific Ocean, where the climate is hot and humid and the temperature is very cold in winter but very hot in summer. Such extreme weather can cause a depletion of body fluid leading to Yin-deficiency in winter while a retention of body fluid leading to Phlegm-dampness in summer. Moreover, the Zhuang people living on the high mountains of Guangxi also have the Phlegm-dampness type of BC due to the hot temperature and high humidity. Blood-stasis is a common BC type found in people living...
in Tsinhai and Xinjiang that lie on high lands where the weather is very dry and cold \[49\]. Such a cold-dry environment induces the onset of “blood-stasis”. It is implied that “heat”, “cold”, “dryness”, and “dampness” inside the body are subject to change with the current temperatures and humidities of the weather.

Yin-Yang interaction

BC can be changed during one’s lifetime. The mechanism of movement is rarely discussed in TCM references. It is, however, necessary to appreciate the movement of changes so that appropriate preventive measures can be applied. In the theory of Yin and Yang, BC is subject to change in accordance with the theory of Yin-Yang interaction \[50\]. The theory comprises three major modes, the mutual opposition, interdependence and mutual transformation of Yin and Yang \[50-52\].

“Mutual opposition between Yin and Yang” is the first mode of interaction \[52\]. Excess of either Yin or Yang will definitely lead to a deficiency of the other and, hence, disease happens (Figure 1). If both Yin and Yang are quite powerful or stable, such mutual restraining and repelling activities can maintain a general equilibrium. This implies that health is maintained if both Yin and Yang maintain equilibrium. If one side is weak, deficient or declining, the other side is strong, excessive or growing. The strong side will overpower the weak side, consequently damaging the general balance of all things. Thus, health risks will result in an imbalanced state of Yin and Yang leading to Yin-deficiency or Yang-deficiency \[45, 53\].
“Interdependence between Yin and Yang” is the second mode of interaction in the theory of Yin and Yang [52]. To maintain existence, Yin and Yang have to balance with each other (Figure 2). In accordance with the Yellow Emperor’s Canon of Internal Medicine, Yin grows while Yang is in vigor, and becomes deficient while Yang is weakened [45]. Yin and Yang must exist as a pair and neither can exist solitarily. Hence, Yin cannot survive without Yang and vice versa, just as oil in a lamp becomes rancid in the absence of a spot of fire or a spot of fire cannot survive without the lamp being filled up with oil. While applying the principle of interdependence of the Yin and Yang theory to the human body, a body condition of Yin-deficiency with “heat-dryness”, without regulation, will further generate Yang-deficiency with “cold-dampness” or vice versa, resulting in a Yin-Yang-deficiency type of BC with both “heat-dryness” and “cold-dampness”.

“Mutual transformation between Yin and Yang” is the third mode of interaction [52]. Many things repel when the situation becomes acute; extreme “Yang” can be said to generate “Yin”, and extreme “Yin” can generate “Yang” [45, 52, 54-55]. This means that extreme Yang-deficiency will change into a Yin-deficiency type of BC and vice versa (Figure 2). This is the typical mutual transformation of Yin and Yang, arising as a result of long-term unregulated states of “cold”, “heat”, “dryness” and “dampness” inside the body. The mechanism of BC in the changing process is a complex physiological aspect.

Common types of body constitution
In contemporary CM, CM scholars are innovative in classifying BC based on CM classics and their clinical practices and experiences. Kuang [56] proposed six types of BC, of which five are related to pathology. Wang [57] found nine types of BC which continue to be referred to by contemporary CM professionals. Tien et al. [8] classified BC into 12 types. Female types of BC have been classified into six categories by Chen [58]. In accordance with the basic theory of CM, Zhao [60] classified BC into six types. Ho [61] proposed eight types of BC. Of the above CM scholars, Wang Qi [4, 23-24, 62-63], Kuang Diaoyuan [9, 24, 64], Ho Yuman[24][64] and Chen Weichun[4] are considered to be more representative.

Table 1 presents the classifications of BC in CM by Kuang [56], Wang [57], Ho [60] and Chen [59] into 12 types. Among these BC types, Neutral, Yin-deficiency, Yang-deficiency and Phlegm-dampness types are in agreement with Shen’s review of 23 references pertaining to the classifications of BC [60]. She concluded from the review that Yin-deficiency (23 references), Phlegm-dampness (23 references), Yang-deficiency (22 references) and Neutral (20 references) were in the majority. This indicates that Yin-deficiency, Yang-deficiency, Phlegm-dampness and Neutral types of BC are more favorably recognized in contemporary CM.

However, the classification of BC types still has not been standardized in CM. Chan & Chien [14] reviewed 19 commonly used classifications of BC types as summarized by Kuang [56] between 1978 and 2002. All of the classifications were developed based on CM theories and clinical symptoms of the diseases. Of these 19 classifications, “healthy” type (15 references); Qi-deficiency, Qi-blood-deficiency and Blood-astasis types (10 references); Yin-deficiency, Yang-deficiency and Yin-Yang-deficiency types (9 references); Phlegm-dampness type (10 references); trend-heat and trend-cold types (3 references); organ deficiency type (6 references); and “strong” and “weak” BC types (2 references) were identified. CM scholars have applied different ways in the classifications of BC types including features and signs as “pattern”; “fluid”, “vital-energy” and “blood”; Yin-Yang theory; “phlegm or wetness”; “hot” and “cold”; “strong” and “weak”; organ dysfunctions and “healthy” BC type.

**Diabetes mellitus in Chinese medicine**

‘Wasting-thirst’ is a name for DM in CM [21, 67-68]. DM was already known in ancient China. In the seventh century, CM practitioners of the Tang dynasty understood that people with DM had drastic weight loss, sweet urine and muscle wasting [69]. Diabetic complications were also mentioned in a few Chinese medical classics, such as inflammatory skin as recorded in the Treatise on the Pathogenesis and Manifestations of All Diseases written by Chao Yuanfang and published in the year 610 [71]. In this section, DM in contemporary CM, the etiology and pathogenesis of DM in CM, common BC types in DM are reviewed.

**Diabetes mellitus in contemporary Chinese medicine**

In Western medicine, DM is classified as type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM). T1DM is an insulin-dependent or childhood-onset DM characterised by a lack of insulin production [70]. Persons with T1DM require insulin injection as diabetic treatment. T2DM is a non-insulin-dependent or adult-onset DM, which is, however, caused by the body’s ineffective use of insulin as a consequence of overweight or obesity, physical inactivity and stress [68]. Persons with T2DM require either diet control alone or supplemented with oral diabetic medication and/or insulin injection. In contemporary CM, Huang & Zhu [71] opined that the DM as described by Zhang Zhong-Jing (the Great Doctor in the 3rd century of China) was similar to T2DM. Zhang emphasized more on the “three-excesses” (excess drinking, excess oral intake and excess urination) and “thirst” to be the indicators of DM. Comparatively speaking, the Yellow Emperor’s Cannon of Internal Medicine targeted on the “muscle wasting” rather
than “thirst”. This was, however, alike with T1DM. The former was overweight or obese while the latter was emaciated.

In CM, DM is not treated like T1DM and T2DM in the Western medicine. Treatment variation is based on syndrome differentiation with BC taken into consideration. Blood glucose control is achieved by enhancing the functions of internal organs with a balance of Yin and Yang [69], such as warming the spleen/stomach and kidney [72] and softening the liver [73]. Diabetic treatments include internal and external tonification (herbal medicine), acupuncture, massage, qigong (deep breathing exercise), medicinal cuisine [69] and paste [74]. The treatment mode of DM between Western medicine and CM is different. However, having a large number of clinical observation analysis, Zhu & Ma [75] found that integration of CM and Western medicine for the treatment of DM is more effective than either one alone.

DM is a multiple-organ disease with an imbalance of Yin and Yang [76]. Classically, the organs involved are the lung, spleen/stomach and kidney [77-80]. Furthermore, the Yin-deficiency type of BC occurs in DM as the disease progresses from the initial to the end stage [81-83]. However, Yau et al. [79] discussed the findings from studies conducted by Tang et al. [84] and Zhou et al. [85]. The results showed that there were discrepancies in clinical presentations between the traditional clinical practice for DM and the clinical findings. Yau et al. [79] opined that the traditional clinical presentations in DM, reflecting the ‘triple-wastes’ (heat-dryness occurs among the lung, spleen/stomach and kidney) as a result of body fluid depletion, were not commonly found in clinical practice at any stages of the disease. Yu et al. [80] reported the findings taken from 3000 survey participants with DM (all DM types). The results showed that ‘body heat’ and ‘body fluid’ were found to be either in an excess or deficient in persons with DM. This suggests that pathological changes are not restricted to the lung, spleen/stomach and kidney but can also affect any other organs [80]. Zhou et al. [67] were of the opinion that it was effective to give treatment when persons with DM could have their “unhealthy” BCs identified at different stages of the disease. This was because the BC of DM can be changed by acquired factors or pathological changes during the disease progression. The Yin-deficiency type of BC might not be the only BC in the DM population. According to the clinical evidence reported by Yu et al. [80], “body fluid” could also be in excess, leading to a Yang-deficiency type of BC. The authors concluded that there was more than one BC type in the DM population. They described the necessity of identifying BC types in DM at any stages of the disease.

**Etiology and pathogenesis of diabetes mellitus in Chinese medicine**

Since DM is a multiple-organ disease, pathogenesis of the disease is related to organ dysfunction as a result of an imbalanced state in “heat”, “cold”, “dryness” and “dampness” of the body temperature and humidity. [86]. DM occurs when inner “heat-dryness” is induced by a higher intake of food of hot nature [87]; emotion [88]; exhaustion [89], medication [90], congenital weak organs [45] and “cold” in heart [91]. The DM etiology in CM is different from Western medicine where unhealthy diet, obesity, inactivity, smoking, hypertension, pregnancy and family history are the common causes of DM [92].

Spleen/stomach dysfunction can be caused by a high intake of foods with high fat, high sugar and high salt contents [87], a long-term use of medications due to variation of natures and flavors [90] and congenital weak organ [45]. From a perspective of CM, disordered spleen/stomach is not able to deliver water up to the lung inducing a “heat-dryness” effect on the lung. It rather pushes the water down to the kidney by frequent urination [45, 87]. Lung dysfunction can also be caused by congenital weak organ [45]. A weak lung is not able to generate and promote the water passage to all parts of the body, resulting in “heat-dryness”. “Fire-heat” (severely burning heat) is induced in the liver by anger emotion and congenital weak organ from a CM perspective [88, 45]. Since liver takes charge of promoting the blood circulation and body fluid metabolism in all organs, its dysfunction being caused by the “fire-heat” damages the functions of lung and stomach, which in turn, induce a depletion of body fluid and blood stagnation (slowing down of blood circulation) [36, 88]. Depletion of the body fluid further causes “heat-dryness” in the lung presenting with “dry mouth and throat with adequate water intake”, which is, in fact a classical presentation in DM population [92]. Kidney dysfunction can be caused by exhaustion, such as excessive sexual activity and congenital weak organ causing “heat-dryness”, which in turn fails to pass its essence and water up to the lung and spleen/stomach. Hence, body fluid is depleted causing “dry mouth and throat with adequate water intake” [69, 77]. Heart dysfuction can be caused by its inner cold and as a congenital weak organ [93]. In consequence, it slows down the blood flow leading to affecting the lung, which in turn, will not generate the water passage throughout the body system [91]. As a consequence, the body fluid is forced downward for excretion out of the body through the kidney. Thus, DM occurs.

**Body constitution in diabetes mellitus**

Classification of BC in DM has been drawing the attention of CM scholars and practitioners. Following is a review of
the BC classifications in the DM population, as seen in the last twenty five years. Some researchers found that insulin resistance was associated with the BC in T2DM. [98] Luk [95] reported from an observational study, which was conducted on 84 patients with T2DM. The study aimed at measuring the relationship between their BCs, insulin and glucagon (a hormone for raising the blood glucose level). Yin-deficiency with “heat-dryness” was found to be associated closely with insulin resistance, insulin insensitivity and adverse effects of glucagon. Lai [96] found that insulin sensitivity decreased persistently but that insulin resistance increased (P < 0.05) in the experimental arm with Yin-deficiency. However, the Yin-Yang-deficiency type of BC was found to be associated with a decrease in insulin sensitivity (P < 0.05). Ting [97] reported that insulin resistance and the abnormal secretion of glucagon were associated with Yin-deficiency and Yin-Yang-deficiency. An integrated Yin-deficiency and Yang-deficiency was affected by “heat-excess” and “cold-dampness”. It enhanced the insulin resistance as well as countering adverse effects of glucagon. Yin-deficiency and Yin-Yang-deficiency are likely to be the common “unhealthy” BC types in persons with T2DM. Si & Li [44] conducted a meta-analysis on 1017 publications and found that Yin-deficiency type of BC was comparatively highly prevalent in DM followed by Yang-deficiency. Studies were conducted in the Mainland China on the diagnosis of BC in DM subjects, using self-administered BC questionnaires together with the “Four Examinations” of Chinese Medicine diagnostic techniques by CM practitioners [42,44, 46]. Yin-deficiency, Yang-deficiency and Yin-Yang-deficiency types of BC were found in a sample of 3000 persons with DM [46]. More than 40% of 157 subjects with DM were diagnosed to have Yang-deficiency type of BC [43]. This was independent of the fact they were at different stages in the disease progression, that they were overweight, or had over five years or even over ten years [43]. Zhao [42] reported the finding from a study of 217 cases with T2DM that Yin-deficiency was the basis of DM. Yin-Yang-deficiency type of BC was mostly diagnosed in the study group of subjects aged over 60. Wong’s exploratory study on 18 T2DM cases supports that Yin-deficiency (3 cases), Yang-deficiency (11 cases) and Yin-Yang-deficiency (3 cases) are the common BC types in persons with T2DM [98]. In view of the above review, Yin-deficiency, Yang-deficiency and Yin-Yang-deficiency are commonly recognized BC types in persons with DM.

**Conclusion**

BC represents the health status of people. “Unhealthy” BC results from an imbalance of body temperature and humidity, that is, an imbalance of Yin and Yang. Yin-deficiency, Yang-deficiency and Yin-Yang-deficiency are the common types of “unhealthy” BC types found in persons with DM. In order to prevent these “unhealthy” BC evolve further and induce chronic diseases, certain Yin/Yang enhancing dietary therapy or program for DM would be needed. An integration of conventional dietary therapy using nutrition component and Chinese dietary therapy using food nature and flavors would be a future direction in the management of DM and other chronic diseases. The goal of the integrated dietetic practice is to either regulate the “unhealthy” BC presentations or enhance glycemic control in DM management. Ultimately, the disease burden, such as DM-related reduced quality of life, stress of homecare givers and healthcare professionals and the rising healthcare cost would probably be reduced.

**Conflicting interests**

The author declares that she has no conflicting interests.

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