

ORIGINAL RESEARCH ARTICLE

On the Correlation between successful aging and Traditional Chinese Medicine: Impacts on the quality of life of elderly diabetic patients.

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Keywords: elderly; diabetes; successful aging; Traditional Chinese Medicine constitution; quality of life; community.

ABSTRACT

Aims and objectives

To investigate the correlation between successful aging (SA) and Traditional Chinese medicine (TCM) constitution and quality of life (QOL) in elderly diabetic patients.

Design

This was a cross-sectional study in elderly patients with T2DM.

Methods

The convenience sampling method was used to recruit elderly patients with T2DM at the Community Health Service Center, from May to August 2019. The study methods were compliant with the Strobe checklist (See Supplementary File 1).

Result

The average score of SA was 58.0 ± 7.7 points in 143 participants. The factors associated with SA were sex, education, way of living, drinking habits, exercising, sleeping, health condition, and participation in social activities. The elderly diabetic patients with Yin-Yang harmony had the highest score of SA. The elderly diabetic patients with Yin-Yang harmony had the highest score of QOL in all dimensions. The score of SA was positively correlated with QOL in all dimensions (total score: $r=0.498$, $P<0.001$; subscores: $r=0.281-0.550$, all $P<0.05$).

Conclusions

The status of the SA of elderly diabetic patients in the community was moderate. TCM constitution, QOL, and SA were correlated with each other.

Main Contribution to Evidence-Based Practice:

This study indicated that the TCM constitution, QOL, and successful aging were correlated. The more balanced the TCM constitution of elderly diabetes patients was, the higher their scores of QOL and successful aging were.

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What do we already know about this topic?

- The occurrence and development of elderly patients with type 2 diabetes are closely related to the TCM constitution. TCM could be used in the management of elderly patients with type 2 diabetes to improve their QOL.
- Scholars are actively exploring the methods of intervention to promote successful aging, but there is no research on the methods of TCM intervention to promote successful aging.

What is the main contribution to Evidence-Based Practice from this article?

This study indicated that the TCM constitution, QOL, and successful aging were correlated with each other. The more peaceful the TCM constitution of elderly diabetes patients was, the higher their scores of QOL and successful aging were.

What are your research's implications towards theory, practice, or policy?

We should actively explore and develop TCM nursing intervention methods to promote successful aging, improve QOL in elderly diabetic patients, which is also in line with the current health policy situation, and provide a theoretical basis for relevant departments to formulate health care policies for the elderly.

Author' Contributions Statement:

Determine topic selection: Jie Yu, Hong Ji; Investigation: Jie Yu, Yeqing Wang, Change Li; Methodology: Jie Yu, Yeqing Wang; Writing—original draft: Jie Yu; Writing—review & editing: Jie Yu, Hong Ji, Wenxiu Ding.

BACKGROUND

Under the influence of the development of positive psychology in gerontology, researchers proposed the concept of "successful aging" (SA), which emphasizes the potential and advantages of the elderly, rather than their diseases, to cope with the challenges of aging (Wu et al., 2017). The concept of SA includes cognitive behavior, perception, control, life satisfaction, ethics, sense of happiness, healthy survival, and many other aspects (Carstensen et al., 2019; Chen et al., 2020). SA has a subjective dimension, and many scholars studied the subjective views and attitudes of the elderly towards SA (Carstensen et al., 2019; Chen et al., 2020).

The world's population is aging, and the life expectancy of the elderly is longer than ever before (World Health Organization et al., 2011). With aging, various health problems are more likely to occur, and the number of patients with chronic diseases is increasing rapidly ("Chronic disease management in ageing populations," 2012; World Health Organization et al., 2011). Therefore, how to improve the quality of life (QOL) in elderly people and how to achieve more SA is an issue of social concern.

Type 2 diabetes mellitus (T2DM) is one of the common chronic diseases among the elderly in the community, with a prevalence rate of 11% in China (Yang, 2018). The occurrence and development of T2DM are closely related to the Traditional Chinese Medicine (TCM) constitution (XN Wang et al., 2019). The phlegm-damp and damp-heat TCM constitution

are strongly associated with abnormal blood cytokine patterns and insulin resistance (You et al., 2017). Specific TCM interventions can be used to intervene in the different TCM constitution, improving the symptoms and QOL of the patients. In addition, TCM often has fewer side effects than traditional treatments (Y Liu, 1995; Maciocia, 2015).

TCM constitution provide the possibility to improve QOL and the level of SA of elderly patients with T2DM. Therefore, it is of great significance to study the relationship between the SA of patients with T2DM and their TCM constitution and QOL in order to actively explore the nursing intervention methods to promote the SA through TCM interventions. Therefore, the aim of the present study was to investigate the correlation between SA and TCM constitution and QOL in elderly patients with T2DM in the community.

METHODS**Aims**

The aim of the study is to investigate the correlation between SA and TCM constitution and QOL in elderly diabetic patients.

Design

This was a cross-sectional study. The convenience sampling method was used to recruit elderly patients with T2DM at the Community Health Service Center, from May to August 2019.

Sample/participants

The inclusion criteria were: 1) >60 years of age; 2) diagnosed with T2DM according to Standards of Care for Type 2 Diabetes in China (2017 version) (Chinese Diabetes Society, 2018); 3) the ability to communicate with the investigators normally; and 4) informed consent and voluntary participating in this study. The exclusion criteria were: 1) severe cardiovascular or cerebrovascular diseases; 2) liver or kidney function diseases; 3) stroke and limb dysfunction; 4) dementia; 5) mental disorders; or 6) malignant tumors. This study was approved by the Ethics Committee of our hospital.

Data collection

All data were from the questionnaire survey. All participants were required to fill in the general information survey, the Chinese version of the Successful Aging Inventory (SAI), the older version of TCM Constitution Classification and Determination, and the SF-36 scale. The questionnaire was filled in by the participants themselves. If the participants were unable to fill in the questionnaire, the investigators could read out the contents without any induction and fill in the questionnaire for them.

A self-designed questionnaire was used and included basic information such as sex, age, educational level, marital status, number of children, exercising (LY Zhang, 2018), sleeping (LY Zhang, 2018), health condition (Cheng, 2014), monthly income, way of living, drinking habits, smoking habits, eating habits, chronic diseases (diabetes, hypertension, heart disease, cerebrovascular disease, arthritis, chronic bronchitis, emphysema, cervical spondylopathy, and asthma), participation in social activities (LY Zhang, 2018), and self-assessment of SA (Cheng, 2014).

The Chinese version SAI was established based on the middle-level nursing theory of SA by Flood (Troutman et al., 2011) and translated and validated in Chinese by Cheng (Cheng, 2014). There are 20 entries in five dimensions in the scale (intrapsychic factors and survival significance, functional performance mechanism, gerotranscendence, sense of inheritance, and spirituality). The Likert 5-level scoring method is adopted, the corresponding score is 0-4 points, and the total score range is 0-80 points. The higher the score, the higher the degree of SA. The scale has a Cronbach's α coefficient of 0.832 and a split-half reliability of 0.871 (Cheng, 2014).

The older version of TCM Constitution Classification and Determination was simplified based on the TCM Constitution Classification and Determination of the Chinese Society of Chinese Medicine in 2009 and was established by Liu in 2013 (X Liu, 2013). The scale is simplified to 37 entries, including nine subscales of the constitution of Yin-Yang harmony, Qi asthenia, Yang asthenia, Yin asthenia, phlegm-dampness, damp-heat, blood stasis, Qi stagnation, and allergic. Each subscale includes 4-5 entries. Each entry is graded by the Likert 5-level scoring method, and the corresponding score is 1-5 points. The determination criteria are shown in Table 1. The scale has a Cronbach's α coefficient of 0.815 and KMO of 0.772 (X Liu, 2013).

There are 36 entries in eight dimensions in the SF-36 scale, including physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH). The first four dimensions are for the physical component summary (PCS), and the last four dimensions are for the mental component summary (MCS). It also includes an entry of health transitions (HT) to assess health transitions over the past year. All dimensions are scored in the range of 0-100 points. The higher the score is, the better QOL is. The scale was applied to the elderly population in China. Cronbach's α coefficient was 0.914 by reliability and validity test (Cao et al., 2014).

Ethical considerations

The investigator explained the purpose and method of the study to the participants and obtained informed consent.

Data analysis

SPSS 21.0 (IBM, Armonk, NY, USA) was used for statistical analysis. The general data and the distribution of the constitution types of TCM of the subjects were expressed using frequency and percentage. The t-test, ANOVA, and non-parametric tests were used to analyze the influence of demographic data on SA. ANOVA was used to compare the scores of SA and the scores of QOL in patients with different constitution. The Spearman correlation coefficient analysis was used to analyze the correlation between SA and QOL. Two-sided P-values <0.05 were considered statistically significant.

Table 1. Criteria for constitution determination

Type of constitution	Criteria	Determination
Constitution of Yin-Yang harmony	- Subscale score of constitution of Yin-Yang harmony ≥ 17 points - Subscale scores of the other eight constitutions ≤ 8 points	Yes
	- Subscale score of constitution of Yin-Yang harmony ≥ 17 points - Subscale scores of the other eight constitutions ≤ 10 points	Basically yes
	Do not meet the above criteria	No
Biased constitution	Subscale score of the constitution ≥ 11 points	Yes
	Subscale score of the constitution = 9-10 points	Likely yes
	Subscale score of the constitution < 8	Likely no

RESULTS

Characteristics of the participants

A total of 150 questionnaires were handed, and 143 of them were returned and valid for an effective recovery rate of 95.3%. The characteristics of the participants are shown in Table 2. The mean age of the participants was 67.8 ± 6.9 years, 59.4% were male, 64.3% were in the 60-69 age group, 92.3% were married, more than half of the elderly had only one child, and 64.3% thought their health condition was fair.

Status of SA

The total score of SA in the subjects in this study was 35-77 points, with an average score of 58.0 ± 7.7 points. The score of "intrapyschic factors and survival

significance" was 5-32 points, with an average score of 25.6 ± 4.5 points; the score "functional performance mechanism" was 9-20 points, with an average score of 16.6 ± 2.1 points; the score of "gerotranscendence" was 4-19 points, with an average score of 9.7 ± 2.2 points; the score of "sense of inheritance" was 2-4 points, with an average of 3.9 ± 0.3 points; and the score of "spirituality" was 0-8 points, with an average of 2.2 ± 2.3 points.

Factors influencing SA

The influences of the demographic data on the scores of SA are shown in Table 2. There were statistically significant differences in the scores of SA in sex, educational level, way of living, drinking habits,

exercising, sleeping, health condition, and participation in social activities (all $P<0.05$). The pairwise comparisons of the influencing factors of SA are shown in Table 3. In terms of educational level, the score of SA gradually increased with the increase in educational level. The score of an educational level below primary school was the lowest and was significantly different from those of junior high school, high school, and university and above. In terms of way of living, the score of the elderly living with spouses was the highest and was significantly different from that of living with children. In terms of exercising, the score of SA of the elderly who often exercised was higher than that of the elderly who seldom exercised and sometimes exercised and was significantly different from that of the elderly who sometimes exercised. In terms of sleeping, the score of SA gradually decreased with the decline of sleeping quality, and there were significant differences in normal sleeping and sometimes insomnia compared with taking sleeping pills. In terms of health conditions, the score of SA gradually decreased with the decline of health conditions, and there were significant differences in the pairwise comparison of self-assessed good, fair, and poor health conditions. In terms of participation in social activities, the score of SA gradually increased with the increase of participation frequency, and there was significantly different

between occasional participation and regular participation.

Distribution of TCM constitution types

The distribution of the TCM constitution of participants is shown in Table 4. Each person may have more than two types of constitution (Y Liu, 1995; Maciocia, 2015). The types of TCM constitution in elderly patients with T2DM in the community were mainly biased constitution, such as Yin deficiency, Yang deficiency, and phlegm-dampness.

Scores of SA in different constitution

The scores of the SA of elderly patients with different constitution in each dimension are shown in Table 4. Among the nine constitutions, the elderly diabetic patients with Yin-Yang harmony had the highest score of SA, which was significantly different from those with other biased constitution.

Scores of QOL

The scores of QOL in elderly patients with different constitution in each dimension are shown in Table 5. The elderly diabetic patients with Yin-Yang harmony had the highest score of QOL in each dimension, which was significantly different from those with other biased constitution, except in BP.

Table 2. Characteristics of the participants

	n (%)	Score of SA	P for SA
Sex			0.023
Male	85 (59.4)	59.2±8.0	
Female	58 (40.6)	56.2±6.8	
Age			0.385
60-69 years old	92 (64.3)	58.3±7.4	
70-79 years old	40 (28.0)	58.2±8.4	
80-89 years old	11 (7.7)	54.9±7.1	
Education level			0.034
Below primary school	14 (9.8)	52.8±9.3	
Primary school	12 (8.4)	56.0±7.5	
Junior middle school	26 (18.2)	57.8±7.4	
High school (including technical secondary school)	46 (32.2)	58.3±5.9	
University and above	45 (31.5)	59.9±8.3	
Marital status			0.717
Married	132 (92.3)	57.9±7.9	
Widowed	10 (7.0)	58.0±4.4	
Remarried	1 (0.7)	63.0±0.0	

Table 2 (cont)

Number of children			0.73
One	73 (51.1)	58.3±8.6	
Two	51 (35.7)	57.3±6.9	
Three and more	19 (13.3)	58.4±5.9	
Lifestyle			0.043
With spouse	106 (74.1)	58.9±7.7	
With spouse and children	11 (7.7)	57.3±7.3	
With children	10 (7.0)	52.1±6.0	
Living alone	16 (11.2)	56.4±7.2	
Monthly income			0.065
Below 1000 Yuan	16 (11.2)	53.3±7.8	
1000-2000 Yuan	3 (2.1)	58.0±4.6	
2000-3000 Yuan	16 (11.2)	57.7±8.6	
Over 3000 Yuan	108 (75.5)	58.7±7.4	
Drinking habit			0.024
Yes	34 (23.8)	57.2±7.9	
No	109 (76.2)	60.6±6.4	
Smoking habit			0.427
Yes	27 (18.9)	59.0±6.0	
No	116 (81.1)	57.7±8.0	
Eating habit			0.221
Mainly vegetarian diet	12 (8.4)	55.5±9.0	
Mainly carnivorous diet	1 (0.7)	68.0±0.0	
Reasonable combination of meat and vegetable	130 (90.9)	58.1±7.5	
Exercise			0.028
Rare	11 (7.7)	57.6±8.7	
Sometimes (1-3 times a week)	39 (27.3)	55.6±7.8	
Frequent (> 3 times a week)	93 (65.0)	59.4±7.1	
Sleep patterns			0.037
Normal	81 (56.6)	58.8±7.1	
Sometimes insomnia	41 (28.7)	58.4±8.2	
Frequent insomnia	10 (7.0)	56.1±7.8	
Taking sleeping pills	11 (7.7)	52.0±7.5	
Number of chronic diseases			0.83
1	50 (35.0)	58.0±7.3	
2	46 (32.2)	58.5±8.0	
3	31 (21.7)	57.9±8.3	
4	12 (8.4)	56.9±6.9	
5	3 (2.1)	53.3±3.8	
6	1 (0.7)	64.0±0.0	
Health condition			0.006
Very good	5 (3.5)	59.8±7.8	
Good	34 (23.8)	61.1±7.1	
Fair	92 (64.3)	57.4±7.3	
Poor	12 (8.4)	52.7±8.6	

Table 2 (cont)

Participation in social activities			0.043
Occasional	110 (76.9)	57.1±7.8	
Few	10 (7.0)	58.5±5.5	
Sometimes	8 (5.6)	62.0±4.3	
Often	15 (10.5)	62.1±7.7	
Self-assessment of SA			
Very consistent	9 (6.3)	-	
Consistent	60 (42.0)	-	
Fair	58 (40.6)	-	
Not consistent	16 (11.2)	-	

SA, successful aging.

Table 3. Pairwise comparisons of the influencing factors of SA

Entry	Grouping	MD	P
Educational level	Between primary school vs below primary school	-	0.276
		3.214	
	Between below primary school vs junior high school	-	0.045
		5.022	
	Between below primary school vs high school (including technical secondary school)	-	0.018
		5.475	
	Between below primary school vs university and above	-	0.002
		7.148	
Lifestyle	Between living with a spouse vs living with spouse and children	1.576	0.508
	Between living with a spouse vs living with children	6.749	0.007
	Between living with a spouse vs living alone	2.474	0.221
Exercise	Between seldom vs sometimes	1.930	0.448
	Between seldom vs often	-	0.430
		1.874	
	Between sometimes vs often	-	0.008
Sleep patterns		3.804	
	Between normal sleeping vs sometimes insomnia	0.351	0.807
	Between normal sleeping vs often insomnia	2.690	0.286
	Between normal sleeping vs taking sleeping pills	6.790	0.006
Health condition	Between sometimes insomnia vs taking sleeping pills	6.439	0.013
	Between good vs fair	3.664	0.015
	Between good vs poor	8.422	0.001
	Between fair vs poor	4.757	0.038
Participation in social activities	Between occasional participation vs seldom participation	-	0.581
		1.373	
	Between seldom participation vs sometimes participation	-	0.079
		4.873	
	Between occasional participation vs regular participation	-	0.017
		5.006	

SA, successful aging; MD, mean difference.

Table 4. Scores of SA in the elderly patients with different constitutions

Type of constitution	Number of cases (%)	SA score	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5
Constitution of Yin-Yang harmony	13 (9.1)	65.8±4.0	29.7±1.6	17.9±1.1	11.6±2.2	4.0±0.0	2.5±1.6
Constitution of Qi asthenia	16 (11.2)	51.9±6.8*	22.3±6.2*	15.4±2.0*	8.9±2.0*	3.7±0.5	1.6±2.0
Constitution of Yang asthenia	37 (25.9)	58.4±5.9*	26.0±4.5	16.3±1.5	9.5±1.8	3.9±0.4	2.9±2.4
Constitution of Yin asthenia	71 (49.7)	57.5±6.9*	25.5±3.7	16.3±2.1	9.7±2.3	3.9±0.3	2.1±2.3
Constitution of phlegm-dampness	36 (25.2)	55.3±7.6*	24.3±5.3*	15.7±2.0	9.3±2.1*	3.9±0.4	2.1±2.2
Constitution of damp-heat	21 (14.7)	54.2±8.1*	24.8±6.2	15.7±2.9	8.9±2.1*	3.8±0.4	1.0±1.5
Constitution of blood stasis	2 (1.4)	49.0±0.0	23.50±0.71	14.00±1.41	8.00±1.41	3.50±0.71	0.00±0.00
Constitution of Qi stagnation	8 (5.6)	49.5±6.4*	20.1±6.5*	15.3±2.6	9.0±2.0	3.6±0.5	1.5±2.3
Allergies constitution	2 (1.4)	54.5±7.8	25.5±3.5	14.0±0.0	8.0±1.4	3.0±0.0*	4.0±5.7
P		<0.001	<0.001	0.011	0.017	0.001	0.045

Each person might have more than two types of constitution. Dimension 1: "intrapsychic factors and survival significance"; dimension 2: "functional performance mechanism"; dimension 3: "gerotranscendence"; dimension 4: "sense of inheritance"; and dimension 5: "spirituality". SA, successful aging.

*, compare with Constitution of Yin-Yang harmony, difference was statistically significant ($P < 0.05$).

Correlation between SA and QOL

The scores of SA were positively correlated with QOL in all dimensions (all $P < 0.05$) (Table 6).

DISCUSSION

TCM constitution are associated with T2DM (You et al., 2017). TCM could be used in the management of elderly patients with T2DM to improve QOL (Y Liu, 1995; Maciocia, 2015). Therefore, this study aimed to investigate the correlation between SA and TCM constitution and QOL in elderly diabetic patients in the community. The results suggest that the status of the SA of elderly diabetic patients in the community was moderate. TCM constitution, QOL, and SA were correlated with each other. This is of significance to explore the nursing intervention methods to improve QOL and promote SA in the elderly.

The average score of SA in this study was 58.0 ± 7.7 points, which was lower than that of the studies by Troutman et al. (Troutman et al., 2011) and Hu et al. (Hu et al., 2019), but higher than that of Lin et al. (Lin et al., 2018), indicating that the status of SA in this study was at a moderate level (Hu et al., 2019). In the self-assessment of SA in the general information table,

although the elderly diabetic patients had T2DM and other comorbidities, 6.3% of them thought that they were well fit, and 42.0% of them thought that they were fit, which was consistent with the results of Amin et al. (Amin, 2017) that the subjects regarded disease and disability as normal components of aging. Nevertheless, Whitley et al. (Whitley et al., 2016) showed that the self-assessment results of the elderly do not match the results of objective measurements. This indicates that the scale on SA should have a subjective dimension as well as an objective dimension, and the self-assessment of the elderly is of great significance to evaluate SA. Therefore, researchers should pay full attention to understand the views of the elderly on SA.

The influencing factors of SA in this study included sex, education level, way of living, drinking habits, exercising, sleeping, health condition, and participation in social activities. In terms of sex, the SA of males was better than that of females, which was consistent with the literature (Hank, 2011; Li et al., 2006), but it is controversial (Bosnes et al., 2017). The reason might be the differences between samples. In terms of education level, the higher the educational background, the

Table 5. Scores of QOL in elderly patients with different constitutions

Constitution	PF	RP	BP	GH	VT	SF	RE	MH
Yin-Yang harmony	90.0±10.0	92.3±27.7	81.9±17.3	63.5±12.4	83.9±6.2	99.0±3.5	100.0±0.0	81.9±6.7
Qi asthenia	73.4±15.5	51.6±41.3*	59.5±23.0	38.4±13.1*	69.1±14.2*	81.3±21.9	70.8±45.3	67.0±14.4*
Yang asthenia	74.1±18.7	78.4±32.4	70.0±19.8	51.5±13.1	77.7±8.4	91.9±25.4	88.3±28.6	78.9±12.0
Yin asthenia	79.3±15.1	82.4±27.8	70.7±21.6	53.0±15.1	77.0±10.0	94.4±16.9	89.7±24.9	76.1±11.1
Phlegm-dampness	71.7±18.6*	72.2±33.2	63.5±22.5	49.2±14.9	74.8±13.0	85.1±20.5	83.3±34.3	73.6±12.4
Damp-heat	76.2±17.6	71.4±37.3	68.6±19.5	47.9±18.0	74.5±13.9	89.3±19.9	81.0±35.9	72.6±14.2
Blood stasis	67.5±3.5	25.0±35.4	41.0±14.1	35.0±0.0	50.0±35.4*	62.5±35.4	50.0±70.7	48.0±11.3*
Qi stagnation	71.3±16.6	43.8±49.6*	61.4±20.0	37.5±14.1*	63.1±16.2*	70.3±24.0	58.3±49.6	60.5±13.6*
Allergies	65.0±21.2	25.0±35.4	52.0±42.4	30.0±14.1	80.0±0.0	87.5±0.0	66.7±47.2	74.0±14.1
P	0.030	<0.001	0.113	<0.001	<0.001	0.004	0.030	<0.001

QOL: quality of life; PF: physical functioning; RP: role-physical; BP: bodily pain; GH: general health; VT: vitality; SF: social functioning; RE: role-emotional; MH: mental health; PCS: physical component summary; MCS: mental component summary.

*, compare with Constitution of Yin-Yang harmony, difference was statistically significant ($P < 0.05$).

higher the score of SA, as supported by previous studies (Bosnes et al., 2017; Garcia-Lara et al., 2017; Hamid et al., 2012). Because of the higher educational level, the elderly might have more cognitive reserve that could provide them with better employment opportunities and more stable economic conditions, and thus their SA status was better. In terms of way of living, the elderly diabetic patients who lived with their spouse had the highest score of SA. The reason might be that living with a spouse has become the most important way of living for the elderly in China, from which they could obtain the support and company of spouse, and thus it is easier to achieve SA. In this study, whether the elderly diabetic patients drank alcohol or not was an influencing factor of SA. The elderly who did not drink alcohol had a higher level of SA, which was consistent with the results of Bosnes et al. (Bosnes et al., 2017). In terms of exercising, regular exercise could promote SA, which was consistent with previous studies (Gutierrez et al., 2018; Ng et al., 2009; Parslow et al., 2011). Exercising could reduce the incidence of falling down, which is an important health issue for the elderly. In addition, some authors believe that exercising is conducive to the physical and mental health of the elderly, thus improving their health level (Cesari et al., 2015). In terms of sleep, elderly diabetic patients with normal sleeping had a higher level of SA. According to Li et al. (Li et al., 2006), people often have difficulty in sleeping with the increase of age, which would reduce their QOL. In terms of health condition, the score of SA of elderly diabetic patients with good self-evaluated health condition was higher than that of

general and poor self-evaluated health condition, which was consistent with the results of Whitley et al. (Whitley et al., 2016). In terms of participation in social activities, the elderly diabetic patients who often participated in social activities had a higher score of SA. Active participation in social activities would have an impact on life satisfaction, physical and mental health, and cognition (Canedo et al., 2018), thus affecting the status of SA.

The types of TCM constitution in the 143 cases of elderly patients with T2DM in the community in this study were mainly biased constitution, such as Yin deficiency, Yang deficiency, and phlegm-dampness, and most of the elderly patients had concurrent TCM constitution, which is consistent with the literature (Luo et al., 2019; Zhao et al., 2018). The onset, progression, and prognosis of T2DM were related to biased constitution (XN Wang et al., 2019; You et al., 2017). The scores of SA in elderly patients with different constitution showed that the elderly diabetic patients with Yin-Yang harmony had the highest score of SA, which is supported by Zhang et al. (LY Zhang, 2018). The elderly diabetic patients with Yin-Yang harmony had the highest score of QOL in each dimension, except in BP. A more harmonious constitution of elderly diabetic patients was correlated with a better QOL, as supported by Wang et al. (Q Wang et al., 2007). If the elderly have a higher perception of SA, they would also have a higher life satisfaction (Kars Fertelli & Deliktas, 2019). The results of this study indicated that the TCM constitution, QOL, and SA were

Table 6. Correlation between SA and QOL

SA	PF	RP	BP	GH	VT	SF	RE	MH	Average score of QOL
r	0.287	0.303	0.207	0.457	0.526	0.281	0.392	0.550	0.498
P	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

QOL: quality of life; PF: physical functioning; RP: role-physical; BP: bodily pain; GH: general health; VT: vitality; SF: social functioning; RE: role-emotional; MH: mental health; PCS: physical component summary; MCS: mental component summary.

correlated with each other. The more peaceful the TCM constitution of elderly patients with diabetes was, the higher their scores of QOL and SA were. This suggests that appropriate intervention measures can be taken to correct the biased TCM constitution of elderly patients with T2DM so that they tend to be peaceful, thus improving their QOL and promoting their SA status. At present, scholars in China and abroad are actively exploring intervention to promote SA (Shirani et al., 2019; Vaccaro et al., 2019; KF Zhang et al., 2017), but there is no research on the intervention method of Traditional Chinese Medicine in promoting SA. This study provides a theoretical foundation for such research in the future.

This has limitations. It was conducted in one community health service center. In addition, the cross-sectional design prevents the determination of any cause-to-effect relationship. Future studies should expand the sample size. Longitudinal studies could provide a better understanding of the changes in SA in time.

CONCLUSIONS

This study indicates that the TCM constitution, QOL, and SA were related to each other. The more harmonious the constitution of the elderly is, the higher the scores of quality of life and SA are. This study is of great significance to explore the nursing intervention methods to improve the QOL and promote SA of the elderly. It provides the government and relevant departments with some theoretical basis for the formulation of healthcare policies.

RELEVANCE TO CLINICAL PRACTICE

These findings suggest that TCM constitution, QOL, and SA were correlated with each other.

Conflict of Interest statement

None declared

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References

- Amin, I. (2017). Perceptions of Successful Aging among Older Adults in Bangladesh: An Exploratory Study. *J Cross Cult Gerontol.* 32(2), 191-207. [https://doi.org/ 10.1007/s10823-017-9319-3](https://doi.org/10.1007/s10823-017-9319-3).
- Bosnes, I., Almkvist, O., Bosnes, O., Stordal, E., Romild, U., and Nordahl, H.M. (2017). Prevalence and correlates of successful aging in a population-based sample of older adults: the HUNT study. *Int Psychogeriatr.* 29(3), 431-440. [https://doi.org/ 10.1017/S1041610216001861](https://doi.org/10.1017/S1041610216001861).
- Canedo, A.C., Lopes, C.S., and Lourenco, R.A. (2018). Prevalence of and factors associated with successful aging in Brazilian older adults: Frailty in Brazilian older people Study (FIBRA RJ). *Geriatr Gerontol Int.* 18(8), 1280-1285. [https://doi.org/ 10.1111/ggi.13334](https://doi.org/10.1111/ggi.13334).
- Cao, W.J., Hua, Q.Z., and Wang, Y.J. (2014). Evaluation of psychological characteristics of SF-36 scale application in the elderly in China. *Mod Prev Med.* 41(06), 964-967.
- Carstensen, G., Rosberg, B., Mc Kee, K.J., and Aberg, A.C. (2019). Before evening falls: Perspectives of a good old age and healthy ageing among oldest-old Swedish men. *Arch Gerontol Geriatr.* 8235-44. [https://doi.org/ 10.1016/j.archger.2019.01.002](https://doi.org/10.1016/j.archger.2019.01.002).
- Cesari, M., Vellas, B., Hsu, F.C., Newman, A.B., Doss, H., King, A.C., . . . Group, L.S. (2015). A physical activity intervention to treat the frailty syndrome in older persons-results from the LIFE-P study. *J Gerontol A Biol Sci Med Sci.* 70(2), 216-222. [https://doi.org/ 10.1093/gerona/glu099](https://doi.org/10.1093/gerona/glu099).
- Chen, Y., Wu, Y., Wang, Q., & Ji, H. (2022). On difficulties faced by patients following orthopedic day surgery: an update on International Evidence . *International Healthcare Review* (online). <https://doi.org/10.56226/ihr.v1i2.35>
- Chen, L., Ye, M., and Kahana, E. (2020). A Self-Reliant Umbrella: Defining Successful Aging Among the Old-Old (80+) in Shanghai. *J Appl Gerontol.* 39(3), 242-249. <https://doi.org/10.1177/0733464819842500> .
- Chen, S., & Qin, Y. (2023). On Ethics, Biomedical Education and Health Promotion: International and Chinese Perspectives. *International Healthcare Review* (online). <https://doi.org/10.56226/46>
- Cheng, Y.L. 2014. 'Reliability and Validity of the Chinese Version of Successful Aging Inventory and its application in the study of quality of life, Shandong University.
- Chinese Diabetes Society. (2018). Guidelines for the prevention and treatment of type 2 diabetes in China (2017). *Chin J Pract Intern Med.* 2018,38(04):292-344. <https://doi.org/10.19538/j.nk2018040108>
- Garcia-Lara, J.M., Navarrete-Reyes, A.P., Medina-Mendez, R., Aguilar-Navarro, S.G., and Avila-Funes, J.A. (2017). Successful Aging, a New Challenge for Developing Countries: The Coyoacan Cohort. *J Nutr Health Aging.* 21(2), 215-219. <https://doi.org/10.1007/s12603-016-0728-8> .
- Gutierrez, M., Tomas, J.M., and Calatayud, P. (2018). Contributions of Psychosocial Factors and Physical Activity to Successful Aging. *Span J Psychol.* 21:E26. <https://doi.org/10.1017/sjp.2018.27> .
- Hamid, T.A., Momtaz, Y.A., and Ibrahim, R. (2012). Predictors and prevalence of successful aging among older Malaysians. *Gerontology.* 58(4), 366-370. <https://doi.org/10.1159/000334671> .
- Hu, Y.Q., Ding, J., and Zhou, J. (2019). Successful aging and quality of life of retired cadres in Shanghai. *Chin J Gerontol.* 39(5), 1205-1209.

- Kars Fertelli, T., and Deliktas, T. (2019). A study on the relationship between perceptions of successful aging and life satisfaction of Turkish elderly people. *Perspect Psychiatr Care*. <https://doi.org/10.1111/ppc.12446> .
- Kehinde, O., Dixon-Lawson, K., & Mendelsohn, A. (2023). On Community Pharmacists and Promotion of Lifestyle Modification in Adults with Hypertension: Practice Protocol. *International Healthcare Review* (online). <https://doi.org/10.56226/49>
- Li, N., GUO, M., YOU, S., & JI, H. (2022). On Patient Readiness for Hospital Discharge: an update on recent Evidence. *International Healthcare Review* (online). <https://doi.org/10.56226/ihr.v1i2.30> .
- Lin, X., Tang, J., and Jiang, Y. (2018). The status of successful aging of the elderly in the community and its influencing factors. *Chin J Gerontol*. 38(18), 4550-4553.
- Liu, X. 2013. 'Development and preliminary application analysis on the elderly version of Traditional Chinese Medicine constitution classification and determination', Beijing University of traditional Chinese Medicine.
- Liu, Y. 1995. *The Essential Book of Traditional Chinese Medicine: Clinical Practice* .New York: Columbia University Press.
- Luo, J.L., Zhang, X.X., and Bao, X.Y. (2019). Study on the relationship between the constitution classification and combination of traditional Chinese medicine and elderly patients with type 2 diabetes in the community. *Chin Gen Pract*. 22(5), 516-521.
- Maciocia, G. 2015. *The Foundations of Chinese Medicine: A Comprehensive Text*. Toronto:Elsevier Canada.
- Ng, T.P., Broekman, B.F., Niti, M., Gwee, X., and Kua, E.H. (2009). Determinants of successful aging using a multidimensional definition among Chinese elderly in Singapore. *Am J Geriatr Psychiatry*. 17(5), 407-416. <https://doi.org/10.1097/JGP.0b013e31819a808e> .
- Parslow, R.A., Lewis, V.J., and Nay, R. (2011). Successful aging: development and testing of a multidimensional model using data from a large sample of older australians. *J Am Geriatr Soc*. 59(11), 2077-2083. <https://doi.org/10.1111/j.1532-5415.2011.03665.x> .
- Shirani, M., Kheirabadi, G., Sharifirad, G., and Keshvari, M. (2019). The Effect of Education Program on Health Promotion Behavior on Successful Aging. *Iran J Nurs Midwifery Res*. 24(3), 234-238. https://doi.org/10.4103/ijnmr.IJNMR_31_15 .
- Tian, M., Li , X., Zhou, F., Wang , Y., Wang, Q., Pan , N., & Ji , H. (2023). On the Psychological experiences of Hematopoietic stem cell donors: an update on International Evidence. *International Healthcare Review* (online). <https://doi.org/10.56226.31>
- Troutman, M., Nies, M.A., Small, S., and Bates, A. (2011). The development and testing of an instrument to measure successful aging. *Res Gerontol Nurs*. 4(3), 221-232. <https://doi.org/10.3928/19404921-20110106-02> .
- Vaccaro, M.G., Izzo, G., Ilacqua, A., Migliaccio, S., Baldari, C., Guidetti, L., Emerenziani, G.P. (2019). Characterization of the Effects of a Six-Month Dancing as Approach for Successful Aging. *Int J Endocrinol*. 20192048391. <https://doi.org/10.1155/2019/2048391> .
- Wang, Q. (2005). *Constitution of Traditional Chinese Medicine*. People's Medical Publishing House.
- Wang, Q., Zhu, Y.B., and Wu, C.Y. (2007). Correlation between constitution of traditional Chinese medicine and health-related quality of life. *Chin J Clin Rehab Tissue Eng Res*. 499946-9950.
- Wang, X.N., Tian, J., and Peng, H.L. (2019). Study on the relationship between Yang asthenia, Qi asthenia and type 2 diabetes. *Shanxi Med J*. 48(08), 444-446.

- Whitley, E., Popham, F., and Benzeval, M. (2016). Comparison of the Rowe-Kahn Model of Successful Aging With Self-rated Health and Life Satisfaction: The West of Scotland Twenty-07 Prospective Cohort Study. *Gerontologist*. 56(6), 1082-1092. <https://doi.org/10.1093/geront/gnv054> .
- World Health Organization, National Institute on Aging, National Institutes of Health, and U.S. Department of Health and Human Services. 2011. *Global Health and Aging* (National Institutes of Health: Bethesda).
- Wu, M., Yang, Y., Zhang, D., Sun, Y., Xie, H., Zhang, J., . . . Su, Y. (2017). Prevalence and related factors of successful aging among Chinese rural elders living in nursing homes. *Eur J Ageing*. 14(4), 419-428. <https://doi.org/10.1007/s10433-017-0423-6> .
- Yang, W.Y. (2018). Epidemic characteristics and changing trend of diabetes in China. *Chin Sci Life Sci*. 48(08), 812-819.
- You, H., Zhang, T., Feng, W., and Gai, Y. (2017). Association of TCM body constitution with insulin resistance and risk of diabetes in impaired glucose regulation patients. *BMC Complement Altern Med*. 17(1), 459. <https://doi.org/10.1186/s12906-017-1964-0> .
- Zhang, K.F., Weng, X.Y., and Luo, H. (2017). Evaluation on the effect of health intervention based on successful aging model. *Health Res*. 37(03), 248-251.
- Zhang, L.Y. 2018. 'Study on the relationship between the constitution type of traditional Chinese medicine and successful aging of the elderly in Jinan community', Shandong University.
- Zhao, W.X., Wang, T., and Yin, Y.T. (2018). Correlation analysis of TCM constitution and quality of life of patients with type 2 diabetes in community. *Nurs Res*. 32(7), 1096-1098.
- Xue, X., Wang, Y., Wang, J., Zhao, J., Tang, Y., Song, X., & Xu, C. (2022). On Monitoring Devices for glucose in critical patients during the COVID-19 pandemic: An update on International Evidence. *International Healthcare Review* (online). <https://doi.org/10.56226/ihr.v1i2.29>