

Depression mediates the effect of character strengths on subjective wellbeing of the elderly

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Abstract

Background: With evidence of a rapidly aging population globally, there is need to continuously address the wellbeing of this vulnerable age group. The concern of the subjective wellbeing of the elderly is essential for constructing a healthy and positive aging society. To promote the elderly's subjective wellbeing, the role of character strengths and depression on subjective wellbeing for older adults needs to be explored.

Methods: A large sample of 8839 elders from the 2017-2018 survey of the Chinese Longitudinal Healthy Longevity Survey (CLHLS) were included. The Chinese version of the character strengths scale, the 10-item CES-D scale (Center for Epidemiologic Studies Short Depression Scale) were applied to assess the elderly's character strengths and depression respectively. Self-reported quality of life (SelfQoL) and health (Selfhealth) were used to evaluate the subjective wellbeing in participants. IBM SPSS Statistics 25.0 and AMOS version 23.0 were adopted to analyze the data.

Results: The average age of participants was 81.27 years. Among these elderly participants, a greater character strengths levels were more evidenced and pronounced among those with a younger age, longer years of education, higher household income, greater social security and social insurance, less depression, higher SelfQoL and Selfhealth levels. Depression had a partial mediation effect of character strengths on self-reported subjective wellbeing, which explained a 36% in total variance ($R^2=0.36$). In addition, character strengths had a statistically significant positive and direct effect on subjective wellbeing ($\beta= 0.290$, $P<0.001$). Furthermore, the indirect effect of character strengths to subjective wellbeing was: $\beta=(-0.603)*(-0.378)=0.228$.

Conclusion: Depression is an unignored mediator that regulates the effect of character strengths on subjective wellbeing in the elderly. Character strengths and depression may be the new intervention targets to promote and enhance the elderly's subjective wellbeing. Future tailored intervention should focus on relieving the elderly's depression and promoting the development of their character strengths.

1 Introduction

In recent decades the world has seen a great tendency towards aging populations in all parts the world. The evidence of an aging society in China began in 1999. The number of Chinese people over 60 years had increased to 240.90 million by the end of 2017. The current average life expectancy and the healthy life expectancy of China's population are 76.4 and 68.7 years respectively^[1]. The World Health Organization's (WHO) proposal for a decade of healthy aging signalled a time for successful aging for public health^[2]. Healthy aging was defined as the process of developing and maintaining functional ability that enabled wellbeing in older age groups^[3]. A world report on aging and health also emphasized the importance of promoting wellbeing in the second half of life from a life-course perspective^[4]. The concern of the subjective wellbeing of the elderly was essential to constructing a positive aging society and realizing the strategic goal of healthy China. Today, although many health policies and programs emphasize the importance of good health in the elder population, little evidence exists whether depression acts as a mediation role of character strengths on subjective wellbeing of older people. The intrinsic energy from individual strength may play an enormous role in their self-perceived wellbeing.

2 Background

Subjective wellbeing is emerging as a key reason for intense debate in public policy and economics of the elder population^[5]. The subjective wellbeing of the elderly can be distinguished into three aspects: evaluative wellbeing (or life satisfaction), hedonic wellbeing (feelings of happiness, sadness, anger, stress, and pain), and eudemonic wellbeing (sense of purpose and meaning in life)^[6]. An updated finding illustrated that positive subjective wellbeing was a protective factor for health, such as happiness predicted lower future mortality and morbidity^[7]. Subjective wellbeing and health were closely linked to age, which may serve as a determinant of physical health in older ages^[6]. Consequently, more and more attention is being made to promote subjective wellbeing from a positive psychology perspective.

Character strengths are positive personality traits and valuable psychological indicator, which play important roles in predicting the subjective wellbeing of the elderly^[8]. The inner strength of older populations can contribute to strengthening their experiences of independence, integrity, and enjoying life in general^[9]. The primary inner characteristics such as the strengths of hope, zest, curiosity and also gratitude and love play key roles in the interplay of strengths and satisfaction with life^[10]. Similarly, extraversion and neuroticism continued to be unique and consistent predictors of all facets of subjective wellbeing^[11]. Character strengths and its development are also related to physician-observed overall morbidity. However, character strengths-health and its functioning links are partially moderated by age and gender; and age-gender is associated with physical health and cognitive performance with levels of and changes in character strengths^[12].

Among the elderly, character strengths may be more consequential than social resources for their well-being^[13]. Negative characters are weakly associated with lower quality of life, however this was unlikely to be a causal association^[14]. Character strengths and minor depressive symptoms have an important influence on self-reported quality of life in older age groups^[15]. Some emerging evidence proposed that character strengths and aspects of health interacted to predict level and change trajectories of well-being and emotion in the elderly, however these were not consistent across studies and ,in addition, their study populations were very small. The character strengths of the elderly were associated with their subjective wellbeing. However, the potential path analysis for their associations is rare and still need further exploration.

There are several mediators of the association between character strengths and subjective wellbeing. One possible mediator is job satisfaction. The relationship between extraversion and subjective wellbeing is partially mediated by job satisfaction^[16]. The other potential mediator is emotional condition. Previous research illustrated that emotional stability, in particular, capture the majority of the association between character strengths and subjective wellbeing. Emotional stability accounts for around 34% of the variance in subjective wellbeing^[17]. In addition, emotional stability, in particular, is relatively and strongly associated with self-rated quality of life in older age groups^[15]. Among the elderly, most of them have retired and may be less affected by job satisfaction. Depression is a common negative emotion in the elderly and may be more likely to be a mediator.

Based on this evidence, we proposed that depression is the potential mediator of the association between character strengths and subjective wellbeing in the elderly and therefore a path analysis was applied to clarify its potential mechanism. We propose three hypotheses: (a) depression partially mediates the effect of character strengths on subjective wellbeing; (b) character strengths negatively predicted depression, reverse depression further negatively predicted subjective wellbeing; (c) character strengths has direct positive effect on subjective wellbeing. We obtained the data from a representative national secondary database and analyzed the statistics

using structural equation modeling. Our efforts may provide some new insight into the mediating role of character strengths in promoting subjective well-being in the elderly.

3 Method

3.1 Data

Data from the 2017-2018 survey of the Chinese Longitudinal Healthy Longevity Survey (CLHLS) were used to undertake a secondary analysis. CLHLS is one of the largest national investigations of health and relative factors among older Chinese populations^[18]. CLHLS investigated about half of the counties and cities in the 23 provinces from 1998 to 2018. The survey in 2017-2018 was carried out in close cooperation between Beijing University and the Chinese Centers for Disease Control and Prevention with face to face interview. A total of 113 thousand persons were interviewed. Among them, the elderly aged 80 and above who were most in need accounted for 67.4% and 17.8% were centenarians^[19]. The data has been reported as high-quality by previous studies^[20]. In this study, we only included those who were 60 years or above with valid questionnaires(n=8839).

3.2 Instruments

3.2.1 Character strengths

The Chinese version of the character strengths of the elderly consisted of 7 items, which was developed by CLHLS team and had good validity and reliability^[21, 22]. In designing the scale, the team did not follow existing scales which are developed in Western countries, and might not be appropriate for use in China. They selected some major items from various scales that they believed were appropriate for use with the Chinese elderly. Finally, the character strengths levels of the elderly were assessed by four positive items("Do you always look on the bright side of things? ", "Do you like to keep your belongings neat and clean?", "Can you make your own decisions concerning your personal affairs?", "Are you as happy as when you were younger?"). It also consists of three negative items("Do you often feel fearful or anxious?", "Do you often feel lonely and isolated?", "Do you feel the older you get, the more useless you are?"). These were rated on a five-point frequency scale of 0 (never) to 4 (always). They were also specifically reverse coded for the negative items, thus, a range of 0 to 28 was the sum of all seven items with a higher score indicating greater character strengths levels^[21].

3.2.2 Depression

The 10-item CES-D scale (Center for Epidemiologic Studies Short Depression Scale) were applied: (1) "Are you bothered by things now, that did not usually bother you in the past?" (2) "Is it difficult for you to concentrate when you are doing things?"(3) "Do you feel sad or depressed?" (4) "Do you feel the older you get, the more useless you are?" (5) "Do you feel hopeful about the future?" (6) "Do you feel nervous or scared?" (7) "Are you as happy now as when you were younger?" (8) "Do you feel lonely?" (9) "Do you feel unable to 'get going'?" (10) "Is the quality of your sleep good?".

CLHLS used Chinese translations available at the Center for Epidemiologic Studies website. Interviewees had five answers to choose from in the 10 CES-D items: never, rarely, sometimes, often and always. For the questions (1), (2), (3), (4), (6), (8) and (9), we scored 3 for "always" to 0 for "never". For the questions (5), (7) and (10), we scored

0 for “always (good)” to 3 for “never (very bad)”. Therefore, CES-D scores ranged from 0 to 30 with 10 and 20 as cutoff points for the levels of depressive symptoms^[23].

3.2.3 Subjective wellbeing

Subjective well-being was evaluated by variables of self-rated health(selfhealth) and self-rated QoL(selfQoL), which were assessed separately by questions of “How do you rate your health at present?” and “How do you rate your life at present?” on a four-point scale ranging from 0 (very bad) to 4 (very good)^[21]. Higher scores represented better subjective wellbeing.

3.3 Data analysis

IBM SPSS Statistics 25.0 and IBM AMOS version 23.0 (SPSS Inc., Chicago, IL) were used to analyze the data. Continuous variables were represented by means and standard deviations, while categorical or ranked variables were represented by frequencies and percentages. Chi-Square test was performed to assess categorical data and Kruskal Wallis Test was performed to evaluate continuous ranked data. Spearman correlation was used to examine the relationship of sociodemographic variables, depression, selfQoL and selfhealth. The hypothesized model was tested with the maximum likelihood method in IBM AMOS-23 statistical software. Several model fit indices were estimated to test good fit of model including Chi-Square/degree of freedom (c^2/df), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Cumulative Fit Index (CFI), Incremental Fit Index (IFI), Goodness-of-fit Index (GFI), Normed Fit Index (NFI), and Tucker-Lewis Index (TLI). A good fit model was considered when all path coefficients were significant at the level of 0.05, $c^2/df < 5$, SRMR<0.08, RMSEA<0.08, GFI>0.9, NFI>0.9, TLI>0.9, CFI>0.9^[24]. All analyses were two-tailed.

4 Results

4.1 Participants' demographics

A total of 8839 elder participants were included in this study, with 4305 males and 4534 females. The average age and years of education were 81.27 and 4.07 respectively. The average total income of the household was 43792.69 RMB. About half of the participants(49.6%) were currently married and living with a spouse. More than 90% of the participants had social security or social insurance. The average score of depression, selfQoL and selfhealth were 9.62, 2.91 and 2.51 respectively. 52.1% of the participants scored lower than 10 in depression scale, 45.5% scored between 10 to 20, 2.3% scored higher than 20.

4.2 Different character strengths level among variables

A significant difference was shown in age, gender, years of education, the total income of household, social security status and social insurance, depression, selfQoL, selfhealth(Table 1). The participants who had younger age, longer years of education, higher household income, social security and social insurance, less depression level, higher SelfQoL and Selfhealth level, demonstrated greater character strengths. Females were shown to have higher scores in high character strengths levels when compared with males.

Character strengths levels among variables

	Character strengths levels						Statistics
	Low <19(n=3832)	Median 21(n=2124)	19- 20(n=2124)	High >21(n=2883)			
Male	81.72 2063 53.84%	10.32	80.77 1023 48.16%	10.29	81.02 1448 50.23%	10.23	H=13.72** X2=19.560***
Female	3.65	5.32	4.09	4.80	4.61	5.74	H=76.55***
Age	40881.62	37198.10	44593.99	37119.79	47040.56	37398.93	H=54.37***
Marital status	2882 91.10%		1623 92.21%		2228 93.34%		X2=9.52**
Income	12.36	4.73	9.16	3.97	6.32	3.70	H=2578.38***
Education	2.68	0.74	2.92	0.70	3.21	0.73	H=773.07***
Employment	2.23	0.78	2.53	0.77	2.86	0.82	H=955.07***

p<0.01.

Total score of character strengths were divided into three grades according to tertile range

4.3 Correlation of variables

Table 2. demonstrates the correlation of character strengths, depression, selfQoL and selfhealth. Spearman correlation suggested that character strengths had a negative correlation with depression($\beta=-0.590$), but character strengths had a positive correlation with selfQoL($\beta=0.326$) and selfhealth($\beta=0.361$). It also shows that, on the one hand, depression significantly and negatively correlated with selfQoL($\beta=-0.354$) and selfhealth($\beta=-0.382$). On the other hand, selfQoL significantly and positively correlated with selfhealth($\beta=0.463$).

Table 2 Spearman correlation of variables

Variables	1	2	3	4
1. Character strength	1			
2. Depression	-0.590***	1		
3. SelfQoL	0.326***	-0.354***	1	
4. Selfhealth	0.361***	-0.382***	0.463***	1

***0.001.

4.4 Mediator model

Figure 1. illustrates the standardized effects of coefficients in the mediator model. All path estimates were statistically significant ($P < 0.001$) and correlated with the hypothesized model. Depression had a partial mediation effect of character strengths on self-reported subjective wellbeing, which explained 36% in total variance ($R^2 = 0.36$). Character strengths had a statistically significant negative direct effect on depression ($\beta = -0.603$, $P < 0.001$), while depression further had a statistically significant negative direct effect on subjective wellbeing ($\beta = -0.378$, $P < 0.001$). In addition, character strengths had a statistically significant positive direct effect on subjective wellbeing ($\beta = 0.290$, $P < 0.001$). Furthermore, the indirect effect of character strengths on subjective wellbeing was: $\beta = (-0.603) \times (-0.378) = 0.228$ and self-rated health ($\beta = 0.716$) contributed more to subjective wellbeing than self-rated QoL ($\beta = 0.663$).

Fit indices of the mediator model revealed a good fit of the data: $c^2/df = 1.734$, $P = 0.188$. SRMR was 0.006 and RMSEA was 0.009, which indicated good validity of the measurement construct. The score of GFI, NFI, TLI, CFI, IFI were over 0.9, which further illustrated the good model fit.

5 Discussion

The causal mechanism between character strengths and subjective wellbeing for older Chinese adults is scarce. It was hypothesized that depression partially mediated the effect of character strengths on subjective wellbeing. Other hypotheses were: (a) character strengths negatively predicted depression, while depression further negatively predicted subjective wellbeing; (b) character strengths had a direct positive effect on subjective wellbeing. To test the hypothesis, a maximum likelihood method in structural equation modeling was performed. The aim was to verify the mediator role of depression from character strengths to subjective wellbeing.

The findings of this study supported the hypothesis that depression was a mediator in the pathway between character strengths and subjective wellbeing. Character strengths had a negative direct effect on depression, while depression further had a negative direct effect on self-reported subjective wellbeing. In addition, character strengths had a positive direct effect on subjective wellbeing. The results were consistent with previous researches that highlighted the role of character strengths and depression on subjective wellbeing^[15]. Moreover, the result also illustrates that the elderly who had younger age, longer years of education, higher household income, more social security and social insurance, less depression level, higher SelfQoL and Selfhealth level, demonstrated greater character strengths. These findings expanded those of previous studies by exploring the

mediating role of depression for older adults in China, thus providing a reference for improving the subjective wellbeing of Chinese older populations.

Character strengths are considered as a subset of features of personality traits, which are regulated by the elderly's demographics, such as age, gender, education background, incomes, depression, self reported QoL and health. Character strengths are susceptible to change over a person's entire lifetime. The character strengths, such as neuroticism, extraversion, and openness appeared to diminish as a person ages. This is evidenced by observation of greater character strengths in younger elderly groups^[25]. Previous findings indicated that women reported higher character strengths (such as extraversion, agreeableness, and neuroticism) scores than men, which was slightly inconsistent with our results due to the difference of measurements^[26]. The vulnerability model shows an amplification of neuroticism risk in those with low education, but a decrease of neuroticism risk for higher education. This strongly suggest the a positive association between education levels and character strengths^[27]. In the adult employees, the effect of character strengths on earnings was regulated by gender, namely, women's earnings were strongly affected by character strengths, while the effect of character strengths on men's earnings was small and not always significant^[28]. However, there was no gender difference in the elderly, and their income may be directly related to their character strengths.

This study proved that character strengths decreased the incidence of depression and enhanced the subjective wellbeing of older adults. The results were consistent with previous studies^[15] and provides a specific pathway and coefficient statistics between variables of character strengths, depression and subjective wellbeing. Character strengths are important contributors to an individual's mental health, particularly depression, which may predict recurrence of late-life depression in older adults^[29, 30]. Therefore, more character strengths may represent lower depression. Character strengths or the natural qualities that a person possess determine that one is intrinsically motivated to modify behavior and emotional functioning in later stage of life(third stage). This acts as a protective factor that increase subjective wellbeing especially in the elderly^[31, 32]. Older adults who had higher character strengths level are relatively more likely to have a positive outlook in life and focus on the bright side of things^[33]. Novel ideas and actions (e.g., the urge to play and explore) resulting from an open mind, also have been approved to alleviate depression and improve subjective wellbeing in positive psychology theory^[34]. Our study also indicates that self-rated health($\beta=0.716$) contributed more to subjective wellbeing than self-rated QoL($\beta=0.663$). Self-rated health including the physical and mental health status both affected subjective wellbeing in this study.

The path analysis revealed that depression was a mediator of the effect of character strengths on subjective wellbeing in the elderly, which accounted for 36% in total variance. The size of its indirect effect on character strengths to subjective wellbeing ($\beta=0.228$) was very close to the direct effect size ($\beta=0.290$), which implied that depression is an unignored mediator between character strengths and subjective wellbeing. Depression is a symptom of mental health and had adverse consequences on subjective wellbeing in older adults. About half of the participants(47.9%) had CES-D 10 scores at 10 and over, higher than the incidence in Indonesia and the former sampling in China (2011-2012 survey)^[23]. Our results confirmed the assumption that depressive symptoms in the elderly have increased in China over the past recent years. Nevertheless, the verified pathway described a bright future to improve the mental health and subjective wellbeing of the elderly by cultivating and enhancing their character strengths.

Character strengths and depression may be the new intervention direction to promote the elderly's subjective wellbeing. One future strategy is suggested to enhance the evaluation of character strengths in the elderly and provide tailored intervention to cultivate their character strengths. Furthermore, strength-training interventions (especially those related to emotional stability, extraversion, and conscientiousness) can be used to improve health and well-being^[35]. The other point is to reduce the depression of the elderly and maintain their emotional stability. More attention should be given to the mediating effect of depression on character strengths and subjective wellbeing. Reducing depression may be an effective strategy for promoting the effect of character strengths on the elderly's subjective wellbeing, which still needs further clinical exploration.

Limitations

Although our data were derived from a large Chinese population-based elderly cohort, there were still some limitations. All the older participants were Chinese. Due to cultural diversity, this may limit the validity and applicability of our research results in other countries. Subjective wellbeing may be categorized into many dimensions, but only two indicators were included in our studies and more indicators may be more accurate.

Conclusion

Depression is an unignored mediator that mediated the effect of character strengths on subjective wellbeing in the elderly. More attention should be given to depression and character strengths of the elderly. Future tailored intervention should focus on relieving the elderly's depression and promoting the development of their character strengths. There is also urgent need for effective assessments of character strengths of the elderly to provide a reference for further interventions.

Abbreviations

CLHLS: Chinese Longitudinal Healthy Longevity Survey; SelfQoL: Self-reported quality of life; Selfhealth: Self-reported health; WHO: World Health Organization; 10 CES-D: Center for Epidemiologic Studies Short Depression Scale; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual; CFI: Cumulative Fit Index; IFI: Incremental Fit Index; GFI: Goodness-of-fit Index; NFI: Normed Fit Index; TFI: Tacker-Lewis Index.

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Figures

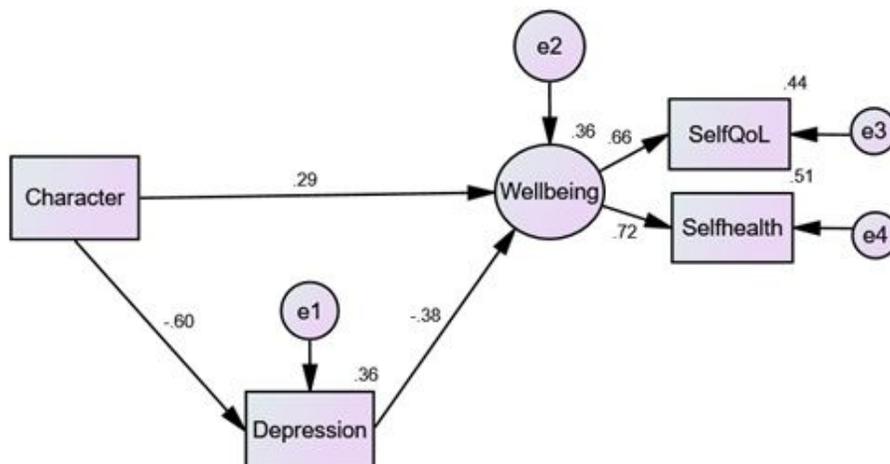


Figure 1

Mediator model Note: Character, represents character strengths; Wellbeing, namely subjective wellbeing.