



Mindfulness, pension, and life satisfaction of retired older adults in China: mediation effects of positive and negative affect

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Abstract

With rising average life expectancies and continuing early retirement, China has more retirees than ever before. This study builds from previous research to understand how mental and financial resources affect life satisfaction amongst 1,018 Chengdu, China retirees. Specifically, our research examined how the extents of mindfulness and pension influence life satisfaction and whether the relations are mediated by positive and negative affect (PANA). The SEM results indicate mindfulness has a significant direct ($\beta=0.26$) and an indirect ($\beta=0.18$) effect on life satisfaction via PANA, while the amount of pension has small effect on life satisfaction ($\beta=0.04$) and only via negative affect. The estimates, however, varied by gender and age. Mindfulness had a strong influence on reducing NA for female older adults while substantially increasing PA for male older adults. Additionally, the amount of pension significantly reduced NA for older retirees aged 65 and above. These findings call for increased mindfulness interventions and robust pension policies to better support retired older adults in China.

Keywords Life satisfaction · Mindfulness · Negative affect · Positive affect · Retired older adults · Retirement · China · Chengdu

Introduction

Within the past two decades, the average global life expectancy has risen from 66.8 to 73.4 (World Health Organization [WHO], 2020). Countries around the world have seen an increase in life expectancy because of efforts to reduce

risk behaviors, advancements in medical knowledge/technology, and even changes in recent migration patterns (Christensen et al., 2009; Aburto et al., 2020). And China is no exception—the life expectancy has increased from 71.6 to 77.4 years from 2000 to 2019 (WHO, 2020). While growing life expectancies are changing and enhancing the way people can live their lives, there are also concerns about how to support ever growing older adults who are living extensively longer in retirement than resources may permit. This concern is particularly potent within China as the older adult population is increasing at an exceptionally quick rate. Accordingly, the United Nations predicts that by 2050 China will be home to more than 366 million older adults, which is larger than the entire US population combined (Desa, 2019). Moreover, Chinese adults tend to retire significantly younger than adults in any other country. As of 2021, the Chinese retirement age varied by gender and job type, but generally men could retire at 60, women, civil servants could retire at 55, and women with other professions could retire at 50 (Zhang et al., 2018; Wang et al., 2021). These young retirement ages, coupled with increasing life expectancy, means Chinese adults are spending on average

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20 to 27 years in retirement, which is 11 to 15 years longer than previous generations (Desa, 2019; Wang et al., 2021).

Currently, China supports 132 million retirees on its social insurance program, which provides retirees financial resources like a pension, medical insurance, and even money for housing (Ministry of Human Resources and Social Security, 2022). The Chinese pension system works similarly to that of the US Social Security income, which requires adults to contribute a portion of their salary throughout their careers, and then upon retirement, individuals are able to collect their government pension (OECD, 2021). Currently the pension program it is a major resource for retirees, as many retirees depend solely on this source of income to maintain and even improve their quality of life.

Beyond the financial challenges that may inhibit retirement, the retirement phase of life is generally filled with opportunity, growth, and change (Foster, 2018; Baumann et al., 2020; Nan et al., 2020). For instance, retirement offers retirees additional time to find self-fulfillment in activities, travel, or hobbies that they were unable to do while working. However, retirees may also face physical and psychological challenges that could hinder their aging, well-being, and ability to reach self-fulfillment (Pepin & Deutscher, 2011; Bauger & Bongaardt, 2016; Kitzmüller et al., 2019). Thus, it is imperative, agencies and governmental social programs know how to foster active aging, and how to help older adults maintain high levels of life satisfaction throughout retirement (Heaven et al., 2013; Coll-Planas et al., 2017; Haslam et al., 2019).

Life satisfaction is a robust predictor of health and general well-being, especially within old age (Gana et al., 2013; Banjare et al., 2015; Baumann et al., 2020). Moreover, life satisfaction is affected by socioeconomic factors such as gender, education, health, and income (Ng & Hamid, 2013; Stenhagen et al., 2014; Lara et al., 2020). For example, older adults with low educational attainment, who live alone, have poor physical or mental health, have low financial resource, and are retired tend to report lower life satisfaction than their counterparts (Ng & Hamid, 2013; Kutubaeva, 2019). Thus, social support and social capital are positively linked with life satisfaction. Therefore, these factors need to be considered in programs for older adults (Matud et al., 2019; Li et al., 2021). Likewise, environmental factors such as age-friendly cities and policies that promote active aging are also positively related to life satisfaction (Xie, 2018; Flores et al., 2019).

Here, we concentrated on the ways financial and mental resources can influence life satisfaction amongst retired, older adults in Chengdu, China. First, research has shown various financial resources, including income, and receiving a pension, are positively related to increased life satisfaction (Ng & Hamid, 2013; Ding, 2017; Abruquah et al.,

2019) as well as increased mental health (Hajek & König, 2022; Zhang et al., 2022). Generally, financial resources are protective factors because they help to reduce material deprivation, while also help to improve positive affect (PA) (Cheung & Chou, 2019; Hajek & König, 2021). Second, research shows mental resources, such as the ability to have self-compassion and a social support network, can improve life satisfaction (Kim & Ko, 2018; Lara et al., 2020; Liu et al., 2020). The higher PA and lower negative affect (NA) are within an individual's life, the more likely the individual is to experience increased life satisfaction (Ng & Hamid, 2013; Jovanović & Lazić, 2020).

Other researchers have started to study the effects mindfulness can have on life satisfaction (Bester et al., 2016; Akhouri & Madiha, 2018; Cheung & Lau, 2021) and the general welfare of older adults (Ghadampour et al., 2018; Lee et al., 2022; Li et al., 2022). Mindfulness refers to a mental state in which a person is actively aware of the present moment in a non-judgmental manner (Hanh, 1976; Kabat-Zinn, 1994). Engaging in daily activities with non-judgmental awareness can enhance one's ability to face personal difficulties, increase PA, and reduce NA.

Moreover, many studies, largely based on data collected from adult samples, have shown mindfulness can improve emotional adaption to promote PA and reduce NA, leading to reduced stress and improved life satisfaction (Mandal et al., 2012; Perez-Blasco et al., 2016; Tumminia et al., 2020). For example, Medvedev and colleagues (2021) collected data from both the general population and the student population ($n=400$), to find mindfulness is positively associated to PA, while negatively related to NA. Likewise, Cheung and Lau (2021) assessed 133 Chinese mindfulness practitioners aged 20–72 and found mindfulness was associated with life satisfaction because it helped to savor positive experiences and gratitude. These findings indicate mindfulness could be used as a point of intervention to increase well-being through positive and negative affect (PANA). However, there are limited empirical studies, especially to older, retired adults, who face unique challenges within their stage of the life in China, on above issues (Li et al., 2021; Zhang et al., 2021). Thus, further empirical research focused on older, retired adults in China is required.

PANA are important elements of subjective well-being (Diener & Emmons, 1984). PA refers to positive moods or emotions, such as optimism, confidence, and flexibility, while NA describes negative moods or emotions, such as worry, fear, and guilt (Lyubomirsky et al., 2005; Bradley et al., 2011). The broaden-and-build theory posits PA expands momentary thought-action repertoire, which helps enable individuals to seek physical, psychological, and social resources within their life (Fredrickson, 2001; Lyubomirsky et al., 2005; Gloria & Steinhardt, 2016; Cheung et al., 2021).

Through this, PA helps individuals achieve more positive accomplishments and feel a higher sense of general well-being. Meanwhile, NA, reduces thought-action repertoire, which prevents individuals from compiling resources they needed to improve their performance and health (Jonas & Lando, 2000; Bradley et al., 2011; Wilkes et al., 2013). As a result, individuals may face a higher likelihood of negative physical and mental health consequences, such as difficulties regulating their emotions and experiencing psychiatric symptoms. Taken together, PANA has a substantial role in formulating awareness, demeanor, and well-being that in turn affect life satisfaction (Weiss, 2002; Zhang & Han, 2016).

Conceptual model and hypotheses

The life course perspective holds that the development of an individual's life is heavily influenced by the historical and socioeconomic context in which they live (Giele & Elder, 1998). Therefore, life transitions, such as retirement, can be heavily influenced by the resources available to the individual (Wang et al., 2011). For example, retired older adults will generally encounter fewer obstacles in retirement if they have more financial resources to meet their basic needs, such as the ability to pay for rent, groceries, and any other expense part of their daily living. Thus, utilizing the life course perspective and the broaden-and-build theory, receiving a pension and practicing mindfulness can be viewed as personal resources which can influence life satisfaction through PANA. Based on existing literature, we propose PANA fully mediates the relationship between resources and life satisfaction. Our hypotheses are as follows:

- 1) Mindfulness is positively associated with PA.
- 2) Mindfulness is negatively associated with NA.
- 3) Amount of pension is positively associated with PA.
- 4) Amount of pension is negatively associated with NA.
- 5) PA is positively associated with life satisfaction.
- 6) NA is negatively associated with life satisfaction.
- 7) PANA mediates the effects between mindfulness and life satisfaction.
- 8) PANA mediates the effects between pension and life satisfaction.

Though current scholarship shows mindfulness and amount of pension influences life satisfaction for older adults, this area of research is incredibly limited within its applicability for older, Chinese adults. Most life satisfaction studies stop short before determining whether financial or mental resources have the larger influence. We wanted to

understand which of these two resources made a bigger impact for retired, older adults in Chengdu, China to cultivate knowledge on how life satisfaction programs and services for retirees could be improved to better support adults. Our findings may advance the current understanding of how resources affect life satisfaction through PANA in a rapidly developing retired population and can shed light on potential policy and practice that may improve the outcomes of this population.

Data and method

Data and sample

Our data is from a convenience sample survey performed in Chengdu, China, in 2022. Five communities within Chengdu, with high proportions of retired, older adults were selected for the study. Each community had around 250 retirees. With support from local social workers and street-level committees, we distributed the survey to retired, older adults at local senior centers within the five communities. 1,167 questionnaires were distributed, and 1,085 of them were returned. 67 questionnaires were missing key variable data, so they were removed, which left 1,018 questionnaires for our final sample size. This data collection took place from April 27, 2022, to June 27, 2022. Before taking the survey, all participants were briefed about their right to give or withhold consent and were made aware that their participation was completely voluntary. Furthermore, every participant was reminded that they could terminate the survey at any point if they chose to do so. Additionally, participants were given 3 RMB (0.5 USD) as compensation. The research review committee at a university in China, where one of the co-authors is affiliated, approved the research protocol.

The average age of the sample was 65.9 (S.D.=9.2), but ages ranged from 50 to 85 years old. About 56% of the sample was female. These descriptive statistics were comparable to the general retired and older adult population in Chengdu, though our sample had more advantaged socioeconomic characteristics than overall older adults generally do. For example, in Chengdu 15.6% of older adults have college degrees (Chengdu Municipal Health Commission, 2022; Sichuan Provincial Bureau of Statistics, 2021). However, 20.3% of the older adults in our study had a college degree.

Measures

First, we measured life satisfaction using Neugarten and colleagues' (1961) 20-item Life Satisfaction Index A (LSIA).

Multiple research studies have demonstrated that the LSIA exhibits strong reliability and validity (Ng & Hamid, 2013; Chehregosha et al., 2016; Parra-Rizo & Sanchis-Soler, 2020). The 20-item questionnaire asked participants to rate how strongly they agreed with various life satisfaction propositions (agree = 2; uncertain = 1; disagree = 0). Afterward, the negatively-worded items were reverse-scored, such that higher scores indicated a higher degree of life satisfaction. The range of scores were between 0 and 40. Additionally, here, the Cronbach's alpha was 0.82.

Second, we utilized the 10-item short-form version of the International Positive and Negative Affect Schedule (I-PANAS-SF) to measure and analyze PANA (Thompson, 2007). This assessment tool has been proven to exhibit internal consistency, cross-sample stability, and both convergent and criterion-related validity (Thompson, 2007; Liu et al., 2020; Jovanovic et al., 2021). The I-PANAS-SF asked participants to answer how often they felt various feelings, such as inspired, determined, hostile, and upset, throughout the past two weeks. The answers ranged from 1 ("never") to 5 ("always"). For each respondent, we averaged the item scores related to PANA. Possible scores ranged from 1 to 5 and the Cronbach's alpha value here was 0.85.

Third, we measured mindfulness using the 20-item short-form version of the Five Facet Mindfulness Questionnaire (FFMQ; Meng et al., 2020). We utilized a version of the FFMQ scale, originally consisting of 39 item, which has demonstrated strong internal consistency and validity in a sample of Chinese individuals (Baer et al., 2006; Meng et al., 2020). Each item was rated on a 5-point Likert scale, ranging from 1 ("never") to 5 ("always"). Subsequently, negatively worded items were reverse coded to ensure higher scores represented higher levels of mindfulness. Next, we calculated the mindfulness score by averaging the item scores. Possible participant final scores spanned from 1 to 5. The FFMQ, here, had a Cronbach's alpha of 0.92. Finally, we assessed participants' pension by asking respondents the amount of pension he/she receives monthly. Amounts of pension were recorded using the Chinese Yuan, or RMB (Renminbi).

Analytical approach

To measure the sample characteristics, we conducted a descriptive analysis of the key variables (life satisfaction, PANA, amount of pension, and mindfulness) and then a conducted a Spearman rank correlation assessment to investigate relationships amongst the variables. We conducted a Structural Equation Modeling (SEM) analysis to investigate how mindfulness and income directly and indirectly affect life satisfaction via PANA. Finally, we evaluated the model fit using standard fit indices, including the comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and chi-square test. We utilized version 16.0 STATA statistical software for all our analyses.

Results

The key variables' descriptive statistics and correlations are summarized in Table 1. The sample's average mindfulness score was 3.1. On average, the sample received a monthly pension of 4,400 RMB (about 650 USD). The mean scores for PA and NA were respectively 2.7 and 1.9. Additionally, respondents relayed an average life satisfaction score of 25.4. The descriptive statistics suggest, on average, the sample had relatively high mindfulness, high PA, experienced below average NA, reported moderate amount of pension, and moderate life satisfaction.

Furthermore, the outcomes of the Spearman rank correlation analysis were largely consistent with our hypotheses. First, mindfulness was positively correlated with PA ($\rho=0.39$, $p<.001$) and negatively correlated to NA ($\rho=-0.18$, $p<.001$). Mindfulness was also positively correlated with life satisfaction ($\rho=0.42$, $p<.001$) and amount of pension ($\rho=0.14$, $p<.001$). Amount of pension was also negatively related to NA ($\rho=-0.15$, $p<.001$) and positively correlated with life satisfaction ($\rho=0.12$, $p<.001$). PA was positively correlated with life satisfaction ($\rho=0.23$, $p<.001$), while NA was negatively correlated with life satisfaction ($\rho=-0.39$, $p<.001$). However, there was no correlation between amount of pension and PA.

Table 1 Descriptive Statistics and Spearman Rank Correlation Analysis of Main Variables

	Mean (S.D.)	1	2	3	4	5
1. Mindfulness [1–5]	3.1 (0.4)	---				
2. Pension	4.4 (1.8)	0.14 ***	---			
3. Positive Affect [1–5]	2.7 (0.9)	0.39 ***	0.01	---		
4. Negative Affect [1–5]	1.9 (0.7)	-0.18 ***	-0.15 ***	0.28 ***	---	
5. Life Satisfaction [0–40]	25.4 (6.4)	0.42 ***	0.12 **	0.23 ***	-0.39 ***	—

Note: N = 1,018

Numbers in parentheses show ranges of the variables. Pension was in RMB, 1 = 1,000 RMB.

** $p < .01$, *** $p < .001$

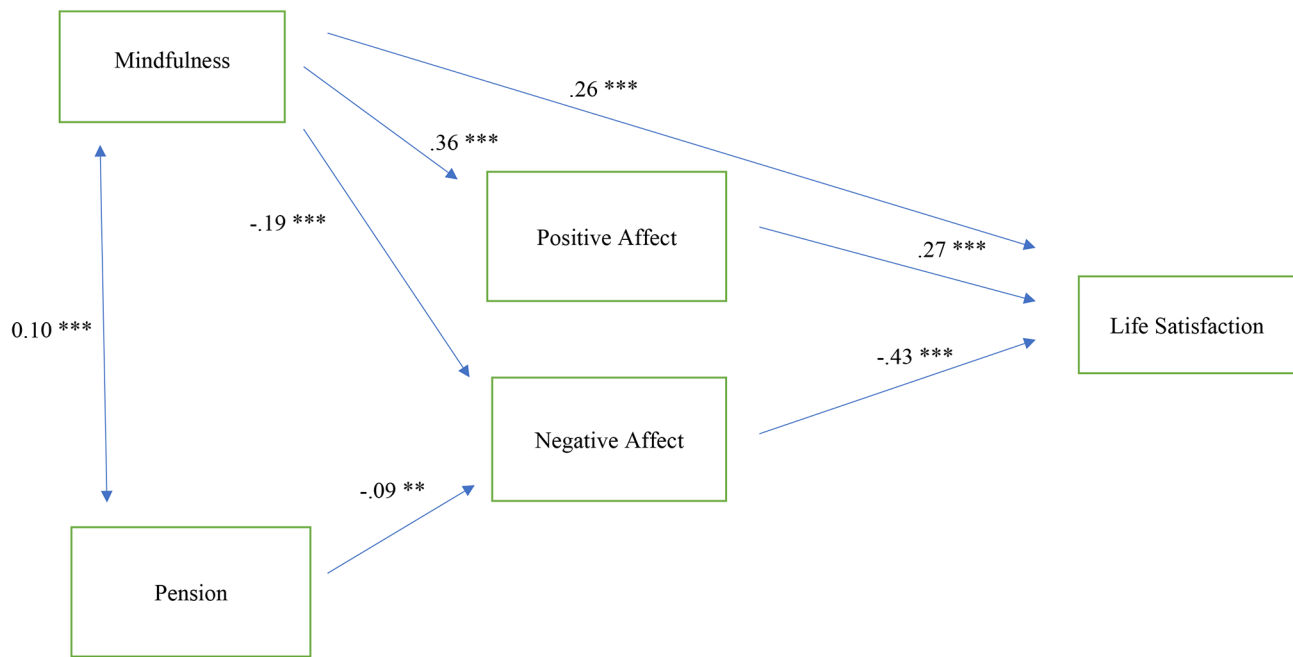


Fig. 1 SEM Standardized Estimates of the Fitted Model
 Note: N=1,018; *** p < .001, ** p < .01

Table 2 Decomposition of Standardized Effects in SEM

Predictor	Outcome Variable	Direct Effect	Indirect Effect	Total Effect
Mindfulness	Positive Affect	0.36 ***	---	0.36 ***
	Negative Affect	-0.19 ***	---	-0.19 ***
	Life Satisfaction	0.26 ***	0.18 ***	0.44 ***
Pension	Positive Affect	---	---	---
	Negative Affect	-0.09 **	---	-0.09 **
	Life Satisfaction	---	0.04 ***	0.04 **
Positive Affect	Life Satisfaction	0.27 ***	---	0.27 ***
Negative Affect	Life Satisfaction	-0.43 ***	---	-0.43 ***

Note: N=1,018. ** p < .01, *** p < .001

We first conducted a full mediation model SEM analysis on our conceptual model. However, the model fit statistics (chi square value = 73.4, $p < .05$; CFI = 0.91; RMSEA = 0.19) suggest the model did not have a good fit within the data. We then relaxed the full mediation assumption, allowed a partial mediation among variables, and only kept significant paths in the final model, as shown in Fig. 1. The revised model has good model fit statistics (chi square value = 4.1, $p = .13$; CFI = 0.99; RMSEA = 0.03). The direct standardized estimates listed in Fig. 1 illustrate that mindfulness had a positive effect on PA ($\beta = 0.36$, $p < .001$) and had a negative effect on NA ($\beta = -0.19$, $p < .001$). These results confirm Hypotheses 1 and 2.

While the amount of pension had no impact on PA, it did have a significant effect on NA ($\beta = -0.09$, $p < .001$). This finding did not support Hypothesis 3 but confirmed Hypothesis 4. PA was positively associated with life satisfaction

($\beta = 0.27$, $p < .001$), while NA was negatively associated with life satisfaction ($\beta = -0.43$, $p < .001$). These findings support Hypotheses 5 and 6. Mindfulness also had a positive direct effect on life satisfaction ($\beta = 0.26$, $p < .001$). Table 2 displays a complete breakdown of the standardized direct and indirect effects of the model. Findings from the indirect effect analysis show that mindfulness ($\beta = 0.18$, $p < .001$) had a positive and indirect effect on life satisfaction through its effect on PANA. Likewise, income ($\beta = 0.04$, $p < .01$) had a positive and indirect effect on life satisfaction through its effect on reducing NA. These findings confirm Hypotheses 7 and 8. Mindfulness, meanwhile, had a relatively large effect on life satisfaction ($\beta = 0.44$, $p < .001$), while the amount of pension an individual receives had a more limited effect on life satisfaction ($\beta = 0.04$, $p < .01$).

We further examined whether these relationships are varied by gender and age (Lu & Wu, 2022; Stenhagen et

Table 3 The SEM Analysis by Gender

Predictor	Outcome Variable	Direct Effect	Indirect Effect	Total Effect
Male (n = 448)				
Mindfulness	Positive Affect	0.41 ***	---	0.41 ***
	Negative Affect	-0.08 +	---	-0.08 +
	Life Satisfaction	0.18 ***	0.19 ***	0.35 ***
Pension	Positive Affect	---	---	---
	Negative Affect	-0.12 **	---	-0.12 **
	Life Satisfaction	---	0.06 **	0.06 **
Positive Affect	Life Satisfaction	0.33 ***	---	0.33 ***
Negative Affect	Life Satisfaction	-0.46 ***	---	-0.46 ***
Female (n = 570)				
Mindfulness	Positive Affect	0.31 ***	---	0.31 ***
	Negative Affect	-0.28 ***	---	-0.28 ***
	Life Satisfaction	0.30 ***	0.19 ***	0.49 ***
Pension	Positive Affect	---	---	---
	Negative Affect	-0.07 +	---	-0.07 +
	Life Satisfaction	---	0.03 +	0.03 +
Positive Affect	Life Satisfaction	0.22 ***	---	0.22 ***
Negative Affect	Life Satisfaction	-0.40 ***	---	-0.40 ***
Likelihood-ratio test	41.1 ***			

Note: N = 1,018. + $p < .10$, ** $p < .01$, *** $p < .001$

Table 4 The SEM Analysis by Age Groups

Predictor	Outcome Variable	Direct Effect	Indirect Effect	Total Effect
Age: ≤ 64 (n = 507)				
Mindfulness	Positive Affect	0.35 ***	---	0.35 ***
	Negative Affect	-0.20 ***	---	-0.20 ***
	Life Satisfaction	0.24 ***	0.17 ***	0.41 ***
Pension	Positive Affect	---	---	---
	Negative Affect	-0.05	---	-0.05
	Life Satisfaction	---	0.02	0.02
Positive Affect	Life Satisfaction	0.26 ***	---	0.26 ***
Negative Affect	Life Satisfaction	-0.41 ***	---	-0.41 ***
Age: > 65 (n = 511)				
Mindfulness	Positive Affect	0.37 ***	---	0.37 ***
	Negative Affect	-0.19 ***	---	-0.19 ***
	Life Satisfaction	0.27 ***	0.19 ***	0.46 ***
Pension	Positive Affect	---	---	---
	Negative Affect	-0.14 ***	---	-0.14 ***
	Life Satisfaction	---	0.06 **	0.06 **
Positive Affect	Life Satisfaction	0.29 ***	---	0.29 ***
Negative Affect	Life Satisfaction	-0.44 ***	---	-0.44 ***
Likelihood-ratio test	53.8 ***			

Note: N = 1,018. + $p < .10$, ** $p < .01$, *** $p < .001$

al., 2014). The gender and age groups results are presented in Tables 3 and 4, respectively. The likelihood-ratio tests revealed that the effects of mindfulness and amount of pension on life satisfaction differed significantly based on gender and age. The effect of mindfulness on PA was greater for males than females (0.41 vs. 0.31), while the effect on NA was greater for females than males (-0.28 vs. -0.08). Mindfulness also had a larger effect on life satisfaction for females (0.49) than males (0.35). In contrast, amount of

pension significantly reduced NA for males (-0.12) while it had no effect on females. PA and NA had overall larger effects on life satisfaction for males (0.33 and -0.46) than females (0.22 and -0.40). As for the differences in age groups, mindfulness showed similar effects on PANA and life satisfaction for older adults in different age groups. But amount of pension had a significant effect on NA for older adults aged 65 and above (-0.14), while it had no significant effect on adults aged 64 and younger (-0.05).

Overall, the SEM findings in this study indicate that mindfulness is significantly and positively related to life satisfaction, both directly and indirectly. The data revealed that the effect of the amount of pension on life satisfaction was limited, primarily through its impact on NA. The subgroup analyses also showed that mindfulness and amount of pension may influence life satisfaction differently, depending on their gender and age.

Discussion

Our analyses confirm that both amount of pension and extent of mindfulness positively influence life satisfaction. And PA and NA serve as mediating variables to this relationship. The current findings support previous research mentioned earlier (Perez-Blasco et al., 2016; Cheung & Chou, 2019; Hajek & König, 2021; Cheung & Lau, 2021; Medvedev et al., 2021), but it also gave new insights into the influence pension and mindfulness can have on life satisfaction. Interestingly, however, mindfulness proved to have a stronger effect on life satisfaction than did the amount of pension. This study is one of the first to contrast these two resources and to compare how mindfulness versus financial resources influence life satisfaction for older, retired adults in China. This research can help social workers and eldercare agencies build stronger programs/resources to better support retired, older adults who may be experiencing poor life satisfaction.

Mindfulness may have had a stronger effect on retirees because it helps people more efficiently process difficult thoughts and emotions without becoming overwhelmed or withdrawn. Thus, it is a tool that can increase PA and reduce NA, which can promote overall life satisfaction (Kabat-Zinn, 1994; Mandal et al., 2012; Cheung & Lau, 2021; Medvedev et al., 2021). In contrast, receiving a high amount of pension modestly reduced NA, and did not influence PA. This finding may suggest that although money may be able to help reduce negative emotion, money may not buy positive emotion or happiness for retired, older adults because of the way some retirees are allocating their expenditures (DeLeire & Kalil, 2010; Lobos et al., 2016; Choung et al., 2021).

Moreover, the SEM analyses show both PA and NA have direct effects on life satisfaction. In particular, NA had a strong effect on life satisfaction ($\beta = -0.43$), while PA had a modest effect on life satisfaction ($\beta = 0.27$). These findings underscore the significance of PANA on life satisfaction in retired older adults and indicates retirement programs and services, as well as social workers, may want to incorporate PANA within life satisfaction interventions for retired, older adults in China.

The subgroup analyses indicated that mindfulness had a greater impact on life satisfaction for female older adults, as it contributed to reducing NA, whereas for male older adults, it mainly led to an increase in PA. The results imply that cultivating mindfulness, which involves being aware of one's thoughts and feelings with a non-judgmental attitude, and using a decentering process, can be beneficial for enhancing life satisfaction in older adults, particularly for females by reducing NA and for males by increasing PA (Garland et al., 2010; 2015; Li et al., 2022). On the other hand, financial resources, such as the amount of pension, are more influential for specific age groups. The amount of pension was found to have a significant effect on reducing NA for older adults aged 65 and above, but no effect was found for those aged 64 and below. These findings suggest that, given pensions have become the primary source of income for many older adults, (Li et al., 2020), the amount of pension is especially important for reducing NA in older retirees who may have depleted their other financial resources, such as savings, over time. This is in contrast to younger retirees, for whom the amount of pension may not have the same impact on reducing NA. Thus, a robust and stable pension policy is a key to life satisfaction of older retirees in China (Li et al., 2020; Han et al., 2022).

This research has numerous practical implications. First, PANA mediated the effects of mindfulness on life satisfaction by approximately 41% (0.18/0.44). This finding suggests interventions and services aimed to increase mindfulness have the potential to help retired, older adults improve life satisfaction by increasing PA and reducing NA. Right now, despite cultural trends to often live with family members and children, older Chinese adults are often geographically distant from their families who have moved to urban cities for employment opportunities (Smith et al., 2014; Liu et al., 2018). This means, many older adults have been left alone, without familial relationships involved in their day-to-day care. Thus, it is important for interventions and services to incorporate mindfulness practices to better reach isolated older adults and to help reduce NA, especially for female older adults.

Second, most research on the effects mindfulness can have on improving life satisfaction through PANA has been focused on the experience of young adults (Mandal et al., 2012; Garland et al., 2015; Perez-Blasco et al., 2016; Tuminia et al., 2020). The findings of this study demonstrate just how powerful mindfulness is, especially for improving life satisfaction of retired, older adults. Thus, future researchers may consider expanding upon our findings to hone in on specific mindfulness interventions that are most effective at improving life satisfaction for retired, older adults.

Third, given the strong effects PANA have on life satisfaction, future agency interventions and services may want to focus on reducing NA, while increasing PA. For example, interventions that rely on positive psychology and gratitude can reduce negative emotions and depressive symptoms, while simultaneously improve eudemonic well-being, life satisfaction, and promote positive change (Ho et al., 2014; Killen & Macaskill, 2015; Dickens, 2017). In addition, interventions that emphasize forgiveness amongst older adults can significantly reduce negative emotions and NA, as well as improve positive mental states (Allemand et al., 2013; López et al., 2021). Consequently, forgiveness-based interventions also can reduce loneliness among retired, older adults.

The subgroup analyses indicate the importance of gender- and age-specific policies and services aimed at promoting life satisfaction among older adults. Mindfulness interventions could be an effective non-financial resource to reduce NA for female older adults and increase PA for male older adults. Meanwhile, financial resources, including pension, should be prioritized in policy initiatives for older retirees, as they are likely to rely more heavily on such resources over time (Abuquah et al., 2019; Li et al., 2020; Han et al., 2022).

Although our study has many practical implications, it also has several limitations as well. First, the use of a cross-sectional design in this study restricted the ability to establish any causal relationships between mindfulness, PANA, and life satisfaction. Therefore, future studies should employ a longitudinal design to establish temporal sequencing and facilitate a better comprehension of the causal relationships among these variables. Second, the survey was based on self-reports of retired, older adults in Chengdu, China. Although self-reporting is a frequently used method for collecting data, it also can incorporate biases that may affect the estimates of the results. For instance, while our survey was anonymous, participants could have underreported NA and overreported PA. Third, the data was collected only from retired, older adults in Chengdu, so our findings may not be generalizable to the experience of other retirees across China. Chengdu is one of most economically developed cities in southwest China (Chengdu Municipal Health Commission, 2022; Sichuan Provincial Bureau of Statistics, 2021), thus, future studies may want to also examine how possible economic and geographic differences in China may also affect the mediational pathway between mindfulness and life satisfaction. Finally, we did not control for the time of the survey. Respondents may have diurnal variability to the questions, particularly for PANA questions, and the circadian typology often differs by gender and age (Adan & Guàrdia, 1993). Further research on this issue is warranted.

Conclusion

The current body of scholarly literature has investigated various factors affecting life satisfaction, yet research on retired older adults in China remains limited. This research sought to fill this knowledge gap and to understand the relative effects of amount of pension and mindfulness can impact life satisfaction for retired, older adults in Chengdu, China. We found while both amount of pension and mindfulness each have a positive relationship with life satisfaction through PANA, mindfulness had a much greater effect than did amount of pension. Even though retirement is lasting longer than it ever has before, many individuals lack the resources and tools to feel satisfied and supported during this life stage. These findings call for the delivery of mindfulness interventions and robust pension policy for older retirees in China to increase life satisfaction and improve overall well-being for an important, yet often misunderstood population.

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Data Availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declare no conflict of interest.

Compliance with ethical Statement The research protocol was approved by the research review committee in the Research Institute of Social Development at Southwestern University of Finance & Economics in China.

Informed consent An informed consent process was implemented prior to the survey; individuals were informed that their participation was voluntary and that they could choose to stop the survey at any time. Written informed consent was waived due to online survey.

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