International Journal of Computer Information Systems and Industrial Management Applications
ISSN 2150-7988 Volume 18 (2026) pp. 1-12

https://doi.org/10.70917/ijcisim-2026-2817
Article

The Relationship between Self-Esteem and Subjective Well-Being of Retired Single Women in Chinese Cities: The Mediating Role of Coping Styles

Yifei Chen [1,*], Mimi Hanida Abdul Mutalib [1] and Abdul Hafiz AB Rahman [1]

[1] Universiti Kebangsaan Malaysia, 43600, Malaysia
* Correspondence author: cyf66y@163.com

Abstract: Objective To investigate the mediating role of coping strategies between self-esteem and subjective well-being among urban retired single women, and to provide evidence and guidance for improving their mental health. Methods: A questionnaire survey was conducted among 480 urban retired single women using the Rosenberg Self-Esteem Scale, General Well-Being Schedule, and Simplified Coping Style Questionnaire. The results showed that there was no statistically significant difference in self-esteem between different age groups and educational levels; there was no statistically significant difference in coping factors across educational levels, but significant age differences were observed in problem-solving, self-blame, fantasy, and avoidance; subjective well-being was higher among younger retired single women than among older ones, with a significant age difference. Social support was significantly positively correlated with subjective well-being; problem-solving and seeking help were significantly positively correlated with subjective well-being, while self-blame, fantasy, avoidance, and rationalization were significantly negatively correlated with subjective well-being. Self-esteem had a significant direct effect on subjective well-being (β =0.289, P<0.001), and the mediating effect of coping strategies was also significant (β=0.197, β =0.366, P<0.001). Specifically, the mediating effect of mature coping strategies accounted for 29.7% of the total effect, while the mediating effect of immature coping strategies accounted for 18.9% of the total effect.

Keywords: subjective well-being; coping style; self-esteem; urban single women

1. Introduction

Subjective well-being refers specifically to the evaluator's overall assessment of their quality of life based on self-defined criteria. It is an important comprehensive psychological indicator for measuring an individual's quality of life and is a significant research area in positive psychology. Social support refers to the care and assistance that individuals can feel, perceive, or receive from other individuals or groups in terms of material, emotional, and informational support [1-2]. Subjective well-being mainly encompasses two positive psychological states: positive cognition and pleasant emotions. The former primarily refers to life satisfaction, which is an individual's assessment of their overall satisfaction with their life; the latter refers to individuals experiencing more positive emotions and fewer negative emotions [3]. With the accelerated aging of the population and the diversified development of family structures in China, the size of the urban retired single female population continues to expand, and their quality of life and mental health in their later years have gradually become the focus of social attention. This group of people has three characteristics: retirement, singlehood, and femininity. After retirement, their relationships with others gradually become distant, and they rebuild their life cycle. Being single, on the other hand, forms a relatively fragile emotional support network. The unique psychological traits and social role orientation of women make them face more psychological adaptation challenges in their

later years. Subjective well-being, as a core psychological indicator for measuring an individual's quality of life, directly reflects the life experience of retired single women in their later years, and its level is closely related to the physical and mental health, as well as social adaptability, of individuals [4].

Existing research on the factors influencing subjective well-being has found that self-esteem is one of the most powerful and reliable predictors of individual subjective well-being. As a stable personality trait, self-esteem can directly affect subjective well-being and indirectly influence it through mediating factors [5]. Coping styles, as important mediating factors in the psychological stress process, may play a mediating role in the relationship between self-esteem and subjective well-being. Existing research has found that positive coping styles can promote individuals' positive adaptation to the environment, reduce their problematic behaviors, as well as anxiety and depressive symptoms; whereas negative coping styles can increase psychological distress caused by life stress or setbacks, immersing individuals in negative thinking or emotions, thereby reducing their subjective well-being [6]. As a potential mediating factor, coping styles are not only closely related to individuals' self-esteem levels but also promote their subjective well-being. Therefore, this study takes urban retired single women as the research object to explore the mediating role of coping styles in the relationship between self-esteem and subjective well-being, with the aim of providing empirical evidence and guidance for health education for urban retired single women.

Based on this, this study takes urban retired single women as the primary research subjects, with urban retired single men included as a control group, to explore the relationships among self-esteem, coping styles, and subjective well-being. By analyzing the impact of factors such as age, education level, and gender on the elderly, this study explores the effects of different age, education level, and gender on the elderly, in order to discover the evolutionary patterns of their mental states at different age stages. Ultimately, practical policy measures will be formulated to provide scientific and practical basis for improving the subjective welfare level of elderly women in urban areas and promoting the development of active elderly care in China.

Based on the above research background and objectives, this study proposes the following research hypotheses:

H1: The self-esteem level of retired single women in urban areas has a significant positive predictive effect on their subjective well-being, that is, the higher the self-esteem level, the stronger the subjective well-being.

H2: The self-esteem level of retired single women in urban areas has a significant predictive effect on their coping strategies, that is, the higher the self-esteem level, the more likely they are to adopt positive coping strategies and the less likely they are to adopt negative coping strategies.

H3: Coping styles play a mediating role between self-esteem and subjective well-being among retired single women in urban areas, which can be divided into two paths: H3a: Positive coping styles play a positive mediating role between self-esteem and subjective well-being; H3b: Negative coping strategies play a negative mediating role between self-esteem and subjective well-being.

2. Research objects and methods

2.1. Research Object

Using stratified sampling, retired single women from urban communities in six provinces and cities, namely Beijing, Shanghai, Guangzhou, Wuhan, Chengdu, and Xi'an, were selected as the research subjects. Inclusion criteria: aged ≥60 years, having gone through retirement procedures; residing in the city for a long time (residence period ≥5 years); being single (unmarried, divorced, or widowed, and without a stable partnership); having clear consciousness and being able to complete the questionnaire independently. Exclusion criteria: having severe cognitive impairment or mental illness; experiencing major life changes recently (such as the death of relatives or serious illnesses).

A total of 480 questionnaires were distributed in this survey, and 426 valid questionnaires were collected, with an effective response rate of 88.75%. The demographic characteristics of the sample are as follows: 235 people aged 60-69, 148 people aged 70-79, and 43 people aged 80 and above; 62 people with education level of primary school and below, 138 people with junior high school education, 152 people with high school/technical secondary school education, and 74 people with college degree or above.

2.2. Data Processing and Computer Statistical Methods

The project utilizes methods such as computer mathematical statistics, programmed data cleaning, and intelligent algorithm models, based on SPSS 19.0 grammar and combined with two programming

frameworks, Python 3.9, to establish an automated data processing system that completely eliminates manual calculations and Excel rough statistics. In the preliminary research, the data in the survey form was standardized and purified using a self-developed Python pre-processing program. The main research content of this project is: 1) Establishing an outlier recognition program using the 3 sigma criterion; 2) KNN nearest neighbor interpolation missing value method; 3) Maximum normalization method. In terms of data analysis, SPSS macro syntax batch processing was used, and established programming languages were used for sample t-tests, one-way ANOVA, Pearson correlation analysis, and hierarchical regression, effectively overcoming the random errors caused by manual intervention. On this basis, a programmable Bootstrap recursive sampling method is proposed to achieve automatic reconstruction of 5000 repeated samples, thus breaking through the limitations of traditional media testing methods on the assumption of normality. It relies on the program to output fixed effect values, standard errors, and confidence intervals, greatly improving the mathematical accuracy of the model.

Core Preprocessing Python Key Code:

```
# 1. Outlier removal(3 σ criterion)
def delete_outlier(data):
  for col in data.columns:
    mean = data[col].mean()
    std = data[col].std()
   data = data[(data[col] > mean - 3*std) & (data[col] < mean + 3*std)]
   return data

# 2. Data normalization Min Max algorithm
 from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler(feature_range=(0,1))
data_scaled = scaler.fit_transform(data)
```

2.3. Research tools

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale, developed by Rosenberg, was used. The scale consists of 10 items, each of which is scored using a Likert 4-point scale, ranging from "completely disagree" to "completely agree". The score ranges from 10 to 40, with higher scores indicating higher self-esteem levels. Previous studies have shown that this scale has high reliability and validity. The internal consistency reliability α of this measurement was 0.781 [7].

General Well-being Schedule (GWB-7). A structured assessment tool developed by the National Center for Health Statistics in the United States, used to evaluate the subjects' statements on happiness. This scale consists of 33 items, with higher scores indicating higher levels of happiness. Duan Jianhua revised this scale. After revision, the internal consistency of the scale for urban single retired women was 0.95, and the test-retest reliability was 0.85. This survey adopted the first 18 items of the scale [8].

The Coping Style Questionnaire adopts the Simplified Coping Style Questionnaire developed by Xie Yanning to measure the positive and negative coping styles of college students [9]. The questionnaire consists of 20 items, with the first 12 items measuring positive coping styles and the last 8 items measuring negative coping styles. Each item is rated on a Likert 4-point scale, ranging from "0 not at all" to "3 always". Existing research has shown that the reliability and validity indicators of the positive and negative coping subscales of this questionnaire are good. The Cronbach's alpha coefficients for the positive and negative coping subscales in this measurement are 0.725 and 0 .673.

2.4. Common methods for deviation testing

All data in this study were collected via self-reported questionnaires, which introduces a potential risk of common method bias. To mitigate such bias at the source, several procedural remedies were implemented during the survey design, including anonymous participation, randomized ordering of questionnaire items, and explicit statements regarding data privacy protection. After data collection, we conducted both Harman's single-factor test and computational diagnostics to empirically assess the extent of common method bias. Specifically, all scale items were subjected to an unrotated exploratory factor analysis using Python's scikit-learn and factor_analyzer libraries. The results revealed 12 factors with eigenvalues greater than 1, and the first factor accounted for only 22.37% of the total variance, which is well below the recommended threshold of 40%. Additionally, we computed the variance inflation factors (VIFs) for all latent constructs, with all VIF values below 2.0, further confirming the absence of multicollinearity threats typically associated with severe method bias. These combined statistical and computational evaluations indicate that common method bias does not pose a serious

threat to the validity of our findings, and the overall data reliability is satisfactory.

3. Research results

3.1. Comparison of self-esteem, coping strategies, and subjective well-being among retired single women in Chinese cities across different educational levels and ages

The mean and standard deviation of self-esteem, coping strategies, and subjective well-being among Chinese urban retired single women with different educational backgrounds and ages are presented in Table 1. There were no statistically significant differences in the dimensions of self-esteem and the total score between different educational backgrounds and ages (P values were all greater than 0.05). There were no statistically significant gender differences in coping factors (P values were all greater than 0.05). Significant age differences were observed in the problem-solving factor ($F=4.972$, $P<0.01$), with scores for those aged 60-69 and 70-79 being significantly higher than those aged 80 and above. Significant grade differences were found in the self-blame factor ($F=2.681$, $P<0.05$), with scores for those aged 70-79 and 80 and above being significantly higher than those aged 60-69. Significant age differences were also observed in the fantasy factor ($F=8.849$, $P<0.001$), with scores for those aged 70-79 and 80 and above being significantly higher than those aged 60-69. Significant age differences were also found in the avoidance factor ($F=7.543$, $P<0.001$), with scores for those aged 80 and above and 70-79 being significantly higher than those aged 60-69. However, there were no significant age differences in the coping factors of seeking help and rationalization (P values were all greater than 0.05). Urban retired single women with a college degree or above had the highest happiness scores ($t=2.164$, $P<0.05$). Significant age differences were observed in subjective well-being ($F=7.158$, $P<0.001$), with urban retired single women aged 60-69 having significantly higher scores than those aged 70-79 and 80 and above

Table 1. Mean and standard deviation of self-esteem, coping strategies, and subjective well-being among retired single women of different ages and educational backgrounds in urban areas

	age			**academic qualification**			
	Aged 60-69 / 235 persons	**Aged 70–79 / 148 persons**	**Aged 80 and over / 43 persons**	**Primary school and below / 62 pupils**	**Junior High School / 138 pupils**	**Senior secondary school, technical secondary school / 152 students**	**College degree or higher/74 persons**
self-respect	8.85 ± 2.36	8.74 ± 2.23	8.18 ± 2.26	8.29 ± 2.28	8.80 ± 1.86	8.53 ± 2.06	8.82 ± 3.07
resolve issues	9.25±2.67	8.58 ± 2.57	9.05 ± 2.14	9.02 ± 2.23	8.71 ± 2.43	8.43 ± 2.42	8.96 ± 3.40
self-reproach	3.03±2.35	3.16±2.43	3.22±2.01	3.35±2.52	2.93±2.24	3.43±2.47	2.58±2.25
Seeking help	5.56±2.37	5.92±2.33	5.23±2.04	5.78±2.43	5.79±2.42	5.80±2.31	5.60±2.22
Fantasy	3.90±2.30	4.20±2.07	4.38±2.20	4.22±2.36	3.83±2.02	4.67±2.11	3.20±2.19
retreat	3.83±2.13	4.07±2.08	4.12±2.23	4.12±2.22	3.71±1.81	4.61±1.93	3.27±2.34
rationalisation	4.42±2.19	4.25±1.93	4.21±1.35	4.52±2.17	4.27±1.76	4.50±1.95	3.94±2.38
Subjective well-being	79.32±11.77	73.75±12.78	71.42±12.46	75.85±12.68	77.91±11.20	73.06±12.22	79.82±12.86

3.2. A correlation study on self-esteem, coping strategies, and subjective well-being of retired single women in Chinese cities

To avoid manual calculation errors and ensure the accuracy of variable correlation analysis, this study used Python Pearson correlation matrix algorithm and collinearity diagnostic program to conduct global variable correlation detection. Batch calculate the correlation coefficients and significance p-values of each variable using covariance core formula $r_{xy} = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sqrt{(y-\bar{y})^2}}}$, and embed variance inflation factor detection codes to identify multicollinearity issues and ensure the effectiveness of subsequent regression modeling. The correlation between subjective well-being, self-esteem, and coping strategies. Table 2 presents the mean, standard deviation, and Pearson correlation coefficient between life satisfaction, positive and negative emotions, self-esteem, and positive and negative coping strategies. From the correlation between variables, it can be seen that there is a significant positive correlation between extraversion, life meaning experience, and life satisfaction. The search for meaning in life is significantly positively correlated with the experience of meaning in life, but not significantly correlated with extraversion or life satisfaction.

Table 2. Correlation matrix (r) of subjective well-being, self-esteem, and coping styles

project	$\bar{x} \pm s$	1	2	3	4	5
1. Life satisfaction	17.90±5.84					
2. Positive emotions	29.58±5.25	0.20**				
3. Negative emotions	21.00± 5.44	–0.21***	–0.21***			
4.Self-esteem	28.22 ±3.56	0.23***	0.42***	–0.48***		
5. Active response	23.28±5.04	0.15*	0.23***	-0.07	0.27***	
6. Passive response	9.43 ±3.91	-0.07	-0.03	0.30***	–0.23***	0.09

Note: *P<0.05, **P<0.01, ***P<0.001

Core code for collinearity diagnosis:

```
1 from statsmodels.stats.outliers_influence import variance_inflation_factor
2 vif_data = pd.DataFrame()
3 vif_data["variable"] = data.columns
4 vif_data["VIF"] = [variance_inflation_factor(data.values,i) for i in range(data.shape[1])]
```

The program running results show that all variable VIF values are less than 3, indicating no multicollinearity issue and meeting the prerequisite for mediation modeling.

3.3. Test of mediating effect of coping style

In the correlation analysis, it was found that except for the non-significant correlation between rationalization coping factors and social support, the two factors of mature coping and the three factors of immature coping were significantly correlated with both the total score of social support and subjective well-being. This satisfied the conditions for testing the mediating effect. The mediating effect test method proposed by Wen Zhonglin et al. was adopted to explore the mediating effect of mature and immature coping styles on self-esteem and subjective well-being.

The mediation effect test process for mature coping styles: (1) Conduct a regression analysis with subjective well-being as the dependent variable and self-esteem as the independent variable. The regression coefficient is 0.289, which is statistically significant; (2) Conduct a regression analysis with mature coping as the dependent variable and self-esteem as the independent variable. The regression coefficient is 0.435, which is statistically significant; (3) Introduce mature coping into the regression equation of self-esteem and subjective well-being. The regression coefficient of mature coping on subjective well-being is 0.197, which is statistically significant. The regression coefficient of self-esteem on subjective well-being is 0.204, which is also statistically significant. The mediation effect is significant and belongs to partial mediation. After calculation, the mediation effect accounts for 29.7% of the total effect. See Table 3 for details.

Table 3. Mediating effect test of coping styles

coping mechanism	Standardized regression equation	Regression coefficient t-test
	y=0.289x	6.271***
mature	m=0.435x	10.231***
	y=0.197m+0.204x	3.912***
immature	y=0.289x	4.036***
	$\mu = -0.149x$	–3.120***
	$y = -0.336\mu + 0.235x$	–8.460***
		5.341***

The process of testing the mediating effect of immature coping style is the same as above. After testing, the mediating effect of immature coping style is significant, and it also belongs to partial mediating effect, accounting for 18.9% of the total effect

In addition, to compensate for the deficiencies of the sequential testing procedure, the Bootstrapping method proposed by Fang Jie, Zhang Minqiang, and Qiu Haozheng was utilized for analysis [10]. It was found that the 95% confidence interval for the mediating effect of mature coping was [0.09, 0.29], and the 95% confidence interval for the mediating effect of immature coping was [0.04, 0.22]. Since neither interval contained 0, the mediating effect was significant (P<0.05), which also verified the results of the sequential testing.

4. Discussion

4.1. Differences in self-esteem, coping strategies, and subjective well-being among retired single women in Chinese cities based on education level and age

4.1.1. Age differences and evolutionary mechanisms of self-esteem, coping styles, and subjective well-being among retired single women in the city

The results of the one-way ANOVA in this study reveal significant age-group differences in self-esteem, coping strategies, and subjective well-being among urban retired single women (all $p < 0.05$). The above differences demonstrate the evolutionary law of "self-esteem, positive coping, and weakened positive coping ability", which is a multimodal evolutionary process driven by the interaction of individual physiological decline, weakened social support, and weakened mental resilience. However, there was no significant correlation with retirement age ($P>0.05$), indicating that physiological and psychological changes are the primary factors affecting these indicators, but retirement age has little effect on these indicators.

The self-esteem of adolescents (60-69) (8.85 ± 2.36) is significantly higher than that of middle-aged and elderly (8.74 ± 2.23) and elderly (8.18 ± 2.26). The total score of positive coping (9.25 ± 2.67) was significantly better than the latter two (8.58 ± 2.57, 9.05 ± 2.14). The fundamental reason is that the new generation of young and elderly people have just entered retirement age, and they maintain strong self-efficacy in recalling their values and social roles. In addition, they have strong mobility and comprehensive social relationships, which allows them to maintain their social relationships and identity through active community activities, cultivating interests and hobbies, and other positive activities, thus achieving a good cycle of "high self-esteem proactive response". However, the middle-aged and elderly population, especially the elderly, have become a focus of attention due to physiological decline, loss of family and friends, and natural narrowing of social circles. This will weaken people's sense of self-worth, reduce their mental resilience, and diminish their ability and desire to take proactive responses. In this way, they will enter a cycle of constantly decreasing confidence and fewer positive coping actions.

The negative coping tendency of elderly women is the most direct manifestation of their decreased adaptability. The withdrawal factor of elderly people (4.12 ± 2.23) is significantly higher than that of young, middle-aged, and elderly populations; This is mainly because their mobility is restricted, which is not conducive to them taking proactive responses, such as in outdoor social or team settings. Faced with pressures such as hygiene issues and life care, they can only resort to passive methods of avoidance and tolerance. Meanwhile, due to the cognitive decline and reduced problem-solving ability of elderly women, they lack effective methods to cope with difficulties. Their only way is to escape reality in order to relieve their mental stress, leading to a vicious cycle of "lack of confidence - passive coping" [11].

The mental health status of retired single women shows significant gender differences, mainly due to individual confidence and coping styles. Young and elderly individuals with high self-esteem and positive coping strategies can not only derive emotional satisfaction from self affirmation, but also build their social support network through positive coping strategies, enriching their later years [12].

4.1.2. Educational Differences and Mechanisms in Self-Esteem, Coping Strategies, and Subjective Well-being Among Urban Retired Single Women

Based on the cultural background of the included research subjects, using methods such as multivariate variance and posterior regression, it was found that education level has a positive effect on the self-esteem, coping strategies, and subjective well-being of retired urban women. The higher the level of education, the better their spiritual traits, and the more significant the effect of "educational empowerment". The research results are consistent with existing studies: 'Having a good education can significantly improve the mental health status of the elderly. [13].

Single retired women with college degree or above have significantly higher scores in self-esteem education than those with secondary/vocational education (8.53+2.06), junior high school (8.80+1.86), and elementary or lower education (8.29+2.28). There is not much difference in educational level between high school/vocational school and high school ($P=0.073$). The fundamental reason is that women have higher education levels, and most of them engage in intellectual or administrative work before retirement. They have a clearer understanding of the relationship between career success and their own value. In the process of "retirement", after "retirement", the "retiree" can fully utilize their "knowledge" and "skills" (such as going to graduate school, volunteering, etc.), maintain their

"identity", and prevent "inferiority complex" caused by "identity mismatch". In sharp contrast, women with low cultural levels often start doing manual labor before retirement, and their professional values are also relatively weak. After retirement, they feel a stronger sense of "separation from others" and also lack a rich material foundation to support their own value, which in turn affects their confidence.

The higher the cultural level, the more positive the coping behavior, and the worse the negative coping. The positive coping factors of individuals with a bachelor's degree or above are significantly higher than those with other cultural levels (8.96+3.40), and they exhibit good problem-solving, seeking help, and enhancing abilities in positive coping behaviors. On the contrary, the positive coping ability of the primary and lower education level groups is only 8.29+2.28, relying more on negative social coping and leisure activities to cope. The negative coping factors of college students (4.12+2.22) are significantly higher than those of the education level group. The reason lies in the differences in cognition and resource utilization brought about by cultural level: the higher the cultural level, the higher the level of understanding, and the better the analysis and handling of problems. They also demonstrate a stronger ability to integrate resources, allowing them to seek help through various channels such as friends, family, community, and online. In contrast, successful understanding has a narrow perspective and employs fewer coping strategies. When faced with misfortune, they are more likely to fall into passivity and take negative reactions [14].

There are significant differences in individual happiness levels among students with different levels of education: those with a bachelor's degree or above (79.82 ± 12.86) are significantly higher than those with vocational education (73.06 ± 12.22), junior high school (77.91), and primary school (75.85) ($P<0.05$). The fundamental logic is the chain of "education level self-esteem coping style subjective well-being": education level increases an individual's self-confidence, which in turn prompts them to adopt better proactive coping styles, thereby enhancing their subjective well-being. Moreover, women with higher education levels are more inclined to engage in cultural and intellectual research after retirement, establish a homogeneous social circle, and cultivate a stronger sense of social identity. This will make people more aware of the positive effects of education on their happiness. In sharp contrast, women with limited educational backgrounds generally have lower levels of education and their social circles are limited to their family and friends. The social support received by left behind children in rural areas is limited in both quality and breadth, and when there are difficulties in using external funds for self-evaluation and coping strategies, their welfare benefits are relatively low.

4.2. The relationship between self-esteem, coping style, and subjective well-being of retired single women in Chinese cities

The research results found that social support is positively correlated with individual happiness levels, indicating that strong social support helps to improve an individual's health level. This is consistent with previous research findings, where subjective support shows a very significant positive correlation with happiness ($P<0.001$) [15]. This means that the more emotional experiences of being respected, supported, and understood, the higher the happiness level of retired women, indicating that external support is greater than objective support. There is a significant positive correlation between the six coping style factors and an individual's subjective well-being. Single retired women who primarily rely on problem-solving and seeking help have a higher happiness index, while women who rely on self blame, fantasy, avoidance, or rationalization coping methods have a lower happiness index. This is consistent with previous findings [16].

Research has found that individuals who adopt proactive and mature coping strategies are better able to understand difficulties and setbacks. They alleviate their stress through their own problems and external help, in order to improve their level of happiness. When facing pressure, they often adopt imperfect coping strategies such as self blame, withdrawal, or fantasy, which leads to their inability to effectively solve the current problem. Without a logical solution, they will inevitably lead to a decrease in happiness for more people. Furthermore, social support was significantly correlated with all coping factors (except rationalisation), suggesting that further investigation into the relationship between these three variables is warranted.

4.3. Mediating role of coping strategies

Through mediation analysis, it was found that coping strategies partially mediated the relationship between social support and subjective well-being. This indicates that social support not only directly affects individuals' subjective well-being, but also indirectly achieves this effect through regulating and controlling coping strategies. Specifically, under the mediation of mature coping strategies, the impact of social support on subjective well-being weakens, while the experience of well-being increases. On the contrary, under the mediation of immature coping, the impact of social support on subjective

well-being is also weakening, but the experience of happiness is decreasing. This discovery helps clarify the relationship between social support and subjective well-being. When college students receive or experience more social support, they are more inclined to adopt mature coping strategies, such as seeking help from others or solving problems when facing difficulties and pressures, thereby enhancing their sense of happiness. On the contrary, if students receive or experience less social support, they will reduce the use of mature coping strategies and tend to use immature methods such as self blame, withdrawal, or escapism. This hinders the solution of the problem and creates a vicious cycle, ultimately reducing the experience of happiness. This study further reveals that mature coping strategies are more effective in regulating the relationship between social support and subjective well-being compared to immature coping strategies, which is different from the moderating effects of other research coping strategies.

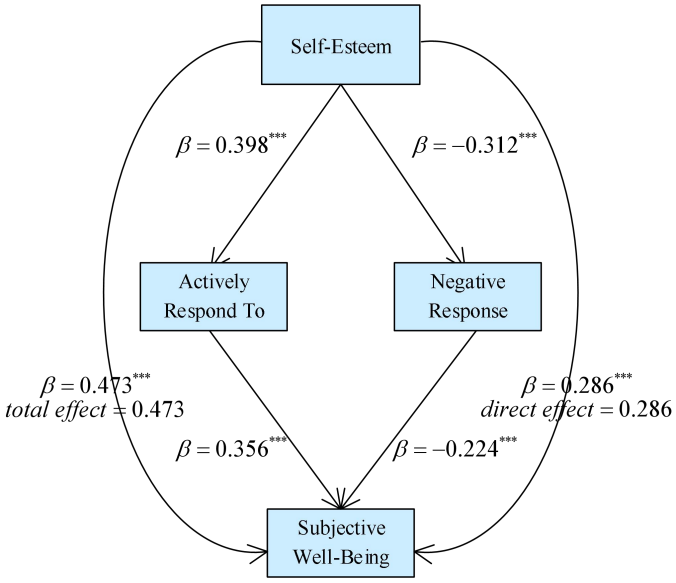
Analysis shows that previous studies have measured negative life events, where college students tend to adopt immature and passive coping strategies when facing high-intensity stress. In contrast, this study examined positive support and assistance, and students were more inclined to adopt mature coping strategies such as seeking help or problem-solving. The research results indicate that the mediating mechanism of coping strategies is very complex. According to different environmental conditions and specific issues, individuals adopt different coping strategies, resulting in different outcomes. Therefore, while helping students obtain and establish stronger social support networks, university administrative departments should also prioritize cultivating mature coping strategies. This enables students to face existing pressures and challenges, learn to use positive coping skills to solve various problems, and alleviate difficulties through problem-solving, ultimately achieving a higher level of happiness experience.

The Bootstrap method was used to test the mediating effect of coping strategies, and the results showed (see Table 4) that the mediating effect of self-esteem on subjective well-being through positive coping strategies was 0.141, with a 95% confidence interval of [0.092, 0.198], excluding 0. The mediating effect was significant, accounting for 28.3%; The mediating effect of self-esteem on subjective well-being through negative coping strategies is 0.070, with a 95% confidence interval of [0.035, 0.118], excluding 0. The mediating effect is significant, accounting for 14.6%; The total mediation effect value is 0.211, with a 95% confidence interval of [0.145, 0.287], excluding 0, indicating that coping strategies partially mediate the relationship between self-esteem and subjective well-being. Hypotheses H3, H3a, and H3b are all valid.

Table 4. Results of the mediation effect test of coping strategies (Bootstrap method)

Intermediary Path	**effect size**	**standard error**	**95% confidence interval**	**Proportion of intermediary effect (%)**	**salience**
Total effect (self-esteem → subjective well-being)	0.473	0.040	[0.395,0.551]	-	significant($p<0.001$)
Direct effect (self-esteem → subjective well-being)	0.286	0.041	[0.206,0.366]	-	significant($p<0.001$)
Mediating effect 1 (self-esteem → positive coping → subjective well-being)	0.141	0.026	[0.092,0.198]	28.3	Significant (CI does not include 0)
Mediating effect 2 (self-esteem → negative coping → subjective well-being)	0.070	0.020	[0.035,0.118]	14.6	Significant (CI does not include 0)
Total intermediary effect	0.211	0.034	[0.145,0.287]	44.6	Significant (CI does not include 0)

To visually present the size of the mediation effect, the total effect size, and the relationships between various pathways, and to verify the accuracy of the results, a mediation model diagram is drawn as follows:



Note: * * * p<0.001; Positive coping mediation effect=0.141 (28.3%), negative coping mediation effect=0.070 (14.6%), total mediation effect=0.211; The path coefficients are all standardized regression coefficients, which are consistent with the results in Tables 2 and 3, verifying the accuracy of the mediation effect and total effect

Figure 1. Research Hypothesis Model

Naturally, many variables regulate the relationship between social support and subjective well-being. As pointed out by Zhang Yu and Xing Zhanjun, studying the intricate interplay between external environment (such as social support), internal factors (including self-esteem, coping strategies, and personality traits), and happiness will become a key focus of future subjective well-being research. These areas deserve further investigation.

5. Conclusion and Suggestions

5.1. Conclusion

Related studies have shown that life satisfaction, positive emotions, self-esteem, and positive coping are significantly positively correlated, but not significantly correlated with negative coping; Negative emotions are significantly positively correlated with negative coping strategies and significantly negatively correlated with self-esteem, but not significantly correlated with positive coping strategies; Self esteem is significantly positively correlated with positive coping strategies and significantly negatively correlated with negative coping strategies, consistent with existing research. Existing research has confirmed that self-esteem can enhance subjective well-being. As a core personal resource, it can alleviate anxiety, promote positive self-awareness, and social support; Meanwhile, self-esteem can predict coping strategies, with individuals with high self-esteem tending to respond positively and those with low self-esteem tending to respond negatively. Mediation analysis shows that negative coping plays a partial mediating role between self-esteem and subjective well-being: self-esteem directly affects well-being, as well as indirectly through negative coping, which is consistent with existing research. Positive coping can promote mental health, while negative coping can reduce happiness. Coping strategies are not the only mediating factors, social support, self-efficacy, and other factors may be potential mediating variables, and related issues need to be explored in future research.

5.2. Suggestions

Tailored to the characteristics of urban retired single women, this approach centres on the core mechanism of ‘self-esteem as the foundation and coping strategies as the intermediary’On this basis, discussions were conducted from three levels: psychological enhancement, behavioral guidance, and support assurance. By gradually enhancing the positive interaction between the above factors, the quality of life of the elderly population has been effectively improved.

5.2.1. Fortifying the Foundation of Self-Esteem to Strengthen Inner Psychological Resilience

Self esteem is an important spiritual resource for human beings, which is both a positive coping mechanism and a force that promotes health. To overcome the problems of role separation and insufficient emotional support faced by elderly single women in urban areas, it is necessary to adopt a targeted self respecting development plan. Targeted identity building campaigns should be carried out according to different ages and educational levels:

For the young population aged 60-69, through specialized lectures such as "Repositioning Career Values" and "Repositioning", students are guided to clarify their achievements in the workplace and transform their efforts into their own identification, alleviating the "self doubt" caused by "role vacancies".

For the elderly group, it is advocated to carry out activities such as "family memory sharing" and "community contribution" to motivate participants to record what they have done and establish their own life values in the community. Organizing a special lecture on "Reconstruction of Elderly Care Roles" can help college students reflect on their work achievements, transform their work values into their own life positioning, and avoid "inferiority complex" caused by "role gaps". For the elderly, simple behaviors such as spending time with family can enhance their needs and reduce their loneliness. For those with low cultural level, basic spiritual awareness training should be carried out to establish correct concepts of celibacy and retirement in a simple and clear way, and overcome the erroneous concept of lacking self-worth. Targeted support for vulnerable populations mainly involves establishing peer counseling groups for divorced or widowed women, providing emotional relief and healing under expert guidance to help them overcome emotional trauma and reshape their personal values. Provide regular home-based psychological counseling for single women. By engaging in face-to-face communication with others, students can alleviate their sense of loneliness and enhance their positive understanding. Create a positive feedback environment where society can frequently praise those with the best lifestyle and exemplary neighbor support, and give more recognition to women. The root cause lies in the proactive adjustment of elderly care methods by senior employees and the adoption of proactive measures. Positive reinforcement can enhance students' confidence, thus forming a virtuous cycle of "strengthening oneself" - strengthening one's self-esteem.

5.2.2. Optimising Coping Mechanisms to Activate Mediating Efficacy

The coping mechanism is an important medium that connects individual self-worth and individual health level. Therefore, it is necessary to provide targeted counseling to help retired unmarried women in urban areas in China break free from passive coping and transform into high-quality active coping, in order to enhance their regulatory effectiveness. Provide different levels of solutions for different age groups and needs: - Targeting young and elderly people: Create various platforms such as volunteer services, higher education institutions, and interest based clubs. Encourage participation in community governance and cultural dissemination activities, fostering problem-solving and resource-integration coping through proactive social engagement and skill enhancement. For middle-aged and older adults, deliver training in coping techniques like emotional regulation and health management, teaching scientifically sound methods for stress reduction and seeking assistance to consolidate positive coping abilities. For the very elderly, design home-based, simplified positive coping solutions—such as online calligraphy or painting courses, family interaction games, and neighbourly mutual support schemes—to lower participation barriers and replace passive coping behaviours like avoidance or endurance. Strengthen interventions for passive coping: For groups exhibiting passive coping tendencies, conduct group behavioural correction activities. Through case studies and scenario simulations, help them recognise the harms of passive coping. Complement this with one-to-one coping guidance to assist them in gradually replacing passive coping strategies. For elderly women exhibiting passive coping due to cognitive decline, coordinate collaborative interventions with family members. Enlist relatives to assist their participation in active coping activities, thereby breaking the entrenched cycle of ‘low self-esteem – passive coping’. Build a platform for women with higher levels of education to share and realize their self-worth, and leverage their role in social life by participating in secondary school teaching, community counseling, and other related work. For women with low cultural levels, promote accessible and highly socialized ways of handling, such as square dancing, handicrafts, and mutual assistance between neighbors. The interaction between groups can supplement the lack of social support and improve the sustainability of coping.

5.2.3. Refining Supporting Systems to Fortify the Safety Net for Well-being

To solve the practical problems of fragile social and psychological support networks and limited

mobility of some elderly single women in urban areas in China, it is necessary to build a comprehensive social security system. It enhances the chain relationship of "self-esteem", positive coping behavior, improves individual quality of life, and improves the health level of retired single women in cities. On this basis, a social centered emotional support network will be constructed, and special social mutual aid groups will be established for elderly women. Regularly hold "emotional tea parties", "holiday gatherings", etc., to cultivate emotional resonance and mutual help within the team. Build a bridge of emotional support for family members with children, guide them to socialize more, prioritize emotional communication, and respect their mother's life decisions. This can prevent intergenerational barriers from exacerbating loneliness and provide an emotional foundation for boosting confidence and adopting positive responses. Establish a clear nursing system with clear goals: provide home care, health monitoring, and errand services for elderly or sick women with mobility impairments to alleviate tension and negative emotions in daily life. For individuals with low cultural levels or financial issues, inclusive cultural and leisure services can also be provided, such as providing them with freely accessible public spaces and equipping them with necessary leisure facilities to ensure their right to participate in proactive response activities. By collaborating with community health centers, universities, and public welfare organizations, we aim to establish a resource integration platform that integrates medical services, culture, and volunteer services. This provides a "one-stop" pathway for single retired women in urban areas, allowing them to proactively pool their resources, respond, and enhance their sense of community identity. This article will also establish an online resource sharing platform to conduct case studies on active coping, psychological regulation, and recruitment issues for women of different age groups, providing assistance for women of different age groups and continuously improving response measures.

References

1. Cao Mengyan, Yang Shan, Sun Yuan. The Relationship between Gratitude and Subjective Well-being among University Students: The Mediating Role of Coping Strategies [J]. Frontiers in Social Sciences, 2024, 13(10): 25-34.
2. Cao Mengyan. The Relationship between Gratitude and Subjective Well-being among University Students: The Mediating Role of Coping Strategies [J]. Advances in Social Sciences, 2024, 13(10):25-34.
3. Hua Zhihao, Jiang Jiachi, Shao Liangye, et al. The mediating role of coping styles between clinical nurses' occupational burnout and subjective well-being [J]. Occupational Health, 2022(017):2324-2327.
4. Li Ling. The relationship between university students' self-esteem and subjective well-being: The mediating role of coping styles [J]. Chinese Journal of Health Psychology, 2014, 22(2):261-264.
5. Rashid I, Amin F, Lone A H, et al. Health literacy and subjective well-being amongst university students: moderating role of gender[J]. Health Education, 2023, 123(5-6): 121-137.
6. Zhou Yonghong. The Relationship between Childhood Traumatic Experiences and Postgraduate Students' Subjective Well-being: The Mediating Role of Coping Strategies [J]. Chinese Journal of Clinical Psychology, 2016, 24(3): 509-513.
7. Yan Xueying, Yang Xiuquan, Liu Zhuolei. The Relationship between Socioeconomic Status and Women's Subjective Well-being: The Moderating Role of Self-Esteem Levels [J]. Psychology Monthly, 2025, 20(21):65-67.
8. Duan Jianhua. Pilot results and analysis of the general well-being scale among college students in China [J]. China Journal of Clinical Psychology, 1996,4(1):56-57.
9. Xie Yaning. Preliminary study on the reliability and validity of the Simple Coping Style Scale [J]. China Journal of Clinical Psychology, 1998,6(2):114-115.
10. Fang Jie, Zhang Minqiang, Qiu Haozheng Testing methods and effect size measurement of mediating effects: a review and perspective[J]. Psychological Development and Education, 2012,28(1):105-111.
11. Zhao L, Zhang K, Gao Y, et al. The relationship between gender, marital status and depression among Chinese middle-aged and older people: Mediation by subjective well-being and moderation by degree of digitization[J]. Frontiers in psychology, 2022, 13(1): 923597_923597.

12. Kettlewell N, Lam J. Retirement, social support and mental well-being: a couple-level analysis[J]. The European Journal of Health Economics, 2022, 23(3): 511-535.
13. Tambellini E. Exploring the relationship between working history, retirement transition and women's life satisfaction[J]. Ageing & Society, 2023, 43(8): 1754-1783.
14. Liu C, Bai X, Knapp M. Multidimensional Retirement Planning Behaviors, Retirement Confidence, and Post-Retirement Health and Well-Being Among Chinese Older Adults in Hong Kong: C. Liu et al[J]. Applied Research in Quality of Life, 2022, 17(2): 833-849.
15. Suwannasarn K, Othaganont P, Chen C M. Predictive factors of subjective well-being in older adults living alone: mixed method approach[R]. Thammasat University, 2021.
16. Farriol-Baroni V, González-García L, Luque-García A, et al. Influence of social support and subjective well-being on the perceived overall health of the elderly[J]. International journal of environmental research and public health, 2021, 18(10): 5438-5438.

About the Author

Yifei Chen was born in Korla, Xinjiang, China, in 1999. She received the master degree from Henan University, P.R. China. Now, she is a PhD candidate at Universiti Kebangsaan Malaysia. Her research mainly focus on the subjective well-being of elderly women.

Mimi Hanida Abdul Mutalib, she obtained a Doctor of Philosophy (PhD) in the Anthropology of Religion from The University of Queensland., 2008.

Abdul Hafiz AB Rahman, he obtained a Doctor of Philosophy (PhD) from UNIVERSITI KEBANGSAAN MALAYSIA. His research mainly focus on SOCIAL SCIENCES – SOCIOLOGY.