Journal of Infrastructure, Policy and Development 2024, 8(7), 4544.
https://doi.org/10.24294/jipd.v8i7.4544

Article

A comparison of subjective well-being between urban and rural elderly in China: Differences and influences

Cong Fan[1], Renxing Chen[2,3,*]

[1] Department of Public Utility Management, School of International Afairs and Public Administration, Ocean University of China, Qingdao 266100, China
[2] Centre for Quality of Life and Public Policy, Shandong University, Qingdao 266237, China
[3] Department of Public Administration, School of Political Science and Public Administration, Shandong University, Qingdao 266237, China
*** Corresponding author:** Renxing Chen, chenrenxing@sdu.edu.cn

CITATION

Fan C, Chen R. (2024). A comparison of subjective well-being between urban and rural elderly in China: Differences and influences. Journal of Infrastructure, Policy and Development. 8(7): 4544. https://doi.org/10.24294/jipd.v8i7.4544

ARTICLE INFO

Received: 4 February 2024
Accepted: 8 March 2024
Available online: 24 July 2024

COPYRIGHT

Copyright © 2024 by author(s). *Journal of Infrastructure, Policy and Development* is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. https://creativecommons.org/licenses/by/4.0/

Abstract: Background: Among urban and rural elderly in China, comprehensive contextual factors of subjective well-being (SWB) have not yet been investigated systematically. Using a large and representative sample of Chinese elderly people, this study explored the predictors of SWB. As outlined in Andersen's behavioral model, predictors can be classified as predisposing, enabling, needing, and health factors. **Methods:** The Chinese General Social Survey (CGSS) is a nationwide, community-based and cross-sectional study conducted between 2003 and 2022. This study used data from 2018. There were 4415 participants aged over 60, including 1763 urban residents and 2652 rural residents. The SWB was measured on a five-point Likert scale ranging from very unhappy to very happy. Estimating potential predictors on SWB was accomplished by using ordinal logistic regression models in the generalized linear method. **Results:** In China, the SWB of urban and rural elderly has greatly improved, and the gap between them has narrowed significantly. Those with spouses, pensions, higher incomes, better self-reported health, and more social activities have better SWB. In the urban elderly, SWB is primarily determined by enabling factors such as personal income, while in the rural elderly, it is primarily determined by need factors such as social participation. **Conclusions:** A variety of factors influence SWB among the elderly. An emphasis should be placed on helping widowed elderly people, those without pension insurance, those with low incomes, and those less involved in social activities. Leisure activities, financial support, social security, and medical services can all be improved to promote the SWB of older people.

Keywords: aging; subjective well-being; behavioral model; self-reported health; social participation

1. Background

The aging of the population has become one of the world's most pressing social issues. Almost all countries are projected to see an increase in their population aged 60 and above between 2005 and 2050 (Bloom et al., 2010). With the largest old population in the world, China is one of the fastest aging countries (Zeng et al., 2017) As of 2020, China has 264 million people aged sixty or older, representing 18.7% of its total population and an annual growth rate of approximately 8 million, according to China's Ministry of Civil Affairs (CMCA). By 2030, the China National Commission on Aging (CNCA) predicts this number will exceed 400 million.

This rapidly growing trend of population aging has attracted widespread attention from researchers and public policy authorities. Currently, the majority of studies focus on the effects of aging on the economy and society, as well as strategies for coping

(Huang et al., 2019). When viewed from the standpoint of the elderly themselves, it is clear that changes in physiological function, economic status, and social role have varying degrees of impact on their dignity and independence, and it is not easy for them to suffer from adjustment crises (Hu and Lu, 2012). In recent years, there has been a rise in the availability of psychological assistance services for the older individuals (Coşkun et al., 2023). It is therefore crucial to consider the micro-level issues of older people, such as spiritual discomfort and psychological health problems. In 2019, China Health Commission survey data show that 30.3% of urban older people suffer from mental health problems, compared to 26.8% of rural older people (CECN, 2019). In rural areas, the suicide rate among older people is high, and suicide prevention and intervention efforts in China are facing significant challenges (Wang, 2013). Poor living conditions, physical ailments, and loneliness are direct causes of suicide among older people in rural areas (Liu, 2016). Older people are suffering from depression more frequently, the most common mental illness, which has a negative impact on their quality of life (Wu et al., 2010). Research on mental health in older people is urgently needed in light of these surprising findings. As part of its 14th Five-Year Plan on Healthy Aging in 2017, China has made mental health a central priority.

Subjective well-being (SWB) and mental health are interrelated (Steptoe et al., 2015). In some way, mental health is a higher-order concept of SWB (Keyes, 2006). The level of SWB can reflect the quality of mental health. A better SWB usually associated with higher levels of mental health. The development of well-being research in the US began in the 1950s, when people's living standards continuously improved, and advancements in positive psychology, health psychology, and other fields led people to focus more on their own survival and development (Wang, 2015). People's SWB is a comprehensive evaluation of the quality of their lives based on internal criteria, including their satisfaction with life and its various aspects, as well as their psychological state dominated by positive emotions (Diener et al., 1999). A subjective, enthusiastic, and comprehensive way of life, SWB can be described as the positive attitudes or feelings that are generated by individuals as a result of comparing their actual life status with their ideal life status (Yang et al., 2021). As a result of the overwhelming epidemic of individualism worldwide, the measurement of SWB is popular since it can be used to rate one's own feelings (Diener, 2000). According to scientific observations, SWB plays a critical role in determining how well older people feel mentally and serves as a reliable indicator of quality of life (Chen and Yang, 2020). SWB has also been applied as an index to measure people's satisfaction or happiness in a nation (Diener, 2000). Basically, the SWB refers to an assessment of the living conditions of older people made by themselves, and it affects the successful aging of society. Policy makers need to give significant attention to this livelihood issue.

The SWB is affected by many factors, including age, gender, occupation, religious affiliation, education, marital status, health, income, etc. The level of income plays a decisive role in one's SWB (Ferrer-i-Carbonell, 2005). The Relative Income Hypothesis (RIH) posits that people tend to focus more on relative income than absolute income, which explains why SWB rises with one's own income and decreases with the average income of their reference group (Clark et al., 2008). According to a study based on survey data from nine Chinese provinces, higher incomes significantly increase the SWB of older people in urban areas; the income effect on rural older

people is less obvious, but the income gap between urban and rural older people has a significant negative impact on SWB (Qi and Zhou, 2010). In addition, income has a direct impact on SWB, as well as a mediating effect on health and recreation (Bai, 2017). Among older people, health status is a crucial factor influencing their quality of life. Self-reported health is typically used to measure one's health status. Responses to a series of questions can provide us with information about an older individual's health status. The questions include whether they have chronic illnesses, if they can take care of themselves on a daily basis, and what their current health status is. A lower health self-rating of older people is associated with a worse SWB (Li et al, 2022).

There has also been extensive research on the role of social activities in SWB among older people. Social interaction or social participation has been shown not only to promote physical health but also to extend life expectancy. Social interaction and social participation promote not only physical health and a longer life expectancy, but also the well-being of older people (González-Herero and García-Martín, 2012; Thomas, 2011). Those who participated in more social activities also had higher SWB, and social activities partially moderated the relationship between personality variables, such as self-esteem and optimism, and SWB (Herero and Extremera, 2010). Senior citizens who participate in social activities have a higher level of SWB than those who do not (Chen and Yang, 2020; Wu, 2012). Based on data collected from the Health Status Survey of the Elderly in China, another study found that leisure activities play a crucial role in improving their Quality of Life (QOL) and SWB, and that self-reported health partially mediates the relationship between leisure activity participation and SWB (Tao and Li, 2017). Taking part in social activities provides immediate emotional benefits through interaction or communication with others and enhances one's social support network, which in turn improves the SWB of older people (Ferlander, 2007). Also, social participation relieves psychological pressure on older people and enhances their socialization of interpersonal relationships, role socialization, and value socialization (Lou et al., 2019). Furthermore, social activities can increase outdoor recreation and exercise for older people and indirectly improve their psychological and physical well-being (Pinquart and Sörensen, 2000). Age, gender, education, current marital status, and other socioeconomic factors have also been identified as predictors of SWB among older people. In the hypothesis, we will elaborate on that.

In most of the existing studies that discuss SWB, there are a number of factors that affect older people' SWB, but a comparative study between urban and rural areas, especially in China, is still lacking. It has long been a prominent feature of Chinese society to have a dual urban-rural structure. Differences in living standards between urban and rural areas are difficult to eliminate quickly, which may affect residents' SWB. A comparative study between urban and rural areas remains necessary. Furthermore, some studies rely more on data analysis than theoretical support. Independent variables are selected at random. Based on data from the Chinese General Social Survey 2018, this study examines the differences in SWB between urban and rural older people, as well as its predictors, using Andersen's behavioral model. In order to better understand the SWB of older people in China, we will examine the impact of economic level, self-reported health, and social participation on their SWB. We expect that our research will contribute to the development of strategies for

improving and promoting older people's well-being.

2. Theoretical framework and research hypotheses

2.1. Theoretical framework

A behavioral model of health services use was initially proposed by Andersen as a way of understanding and explaining how and why people use certain types of health services (Andersen and Newman, 1973). In the theoretical framework, there are causal links and pathways between three core components that result in actual health services access or utilization. This framework provides a solid and durable methods for analyzing health services use. It identifies predisposing factors, individual factors, environmental/institutional enabling factors, and need factors, as well as how they interact to affect health service use. Additionally, it can identify how actual access to health services affects these factors and health outcomes (Andersen, 2008). Overall, Andersen's behavioural model illustrates causal linkages and pathways interacting among different components that lead to health service use and health outcomes. As a result of multiple model adjustments and corrections of the relationship between variables and expansion, the model has become widely used in health services research and system evaluation (Li and Lu, 2017). It measures health behaviors based on their determinants. For example, the costs of medical care (Heider et al., 2014), mental health services (Hochhausen et al., 2009), long-term care (Travers et al., 2020), and the evaluation of quality of life in both general adult populations and older adults (Baernholdt et al., 2011).

It is reasonable to use the SWB of older people as an indicator of health outcomes since it is a comprehensive evaluation of their overall living conditions and closely related to their health. Based on this theory, Chinese researchers developed an analytical framework for predicting SWB. Their study examined the effects of predisposing factors, enabling factors, need factors, and health factors on SWB of older people in China (Xu and Zhou, 2014). In general, predisposing factors refer to individuals' demographic characteristics, such as gender, age, and marital status. The enabling factors mainly involve socioeconomic status variables, such as income. Health factors refer to how one practices and perceives their own health status. Need factors refer to the frequency of participating in social activities. The behavioural model developed by Andersen provides us with a logical framework for evaluating the predictors of SWB in older people. Using this theoretical framework and CGSS data, we examine a variety of predisposing factors including gender, age, education, religiosity, and marriage; enabling factors include annual income and pension insurance; self-reported health is a health factor; whether people participate in community elections and social activities frequency is a need factor. **Figure 1** shows the predictors of SWB among older people.

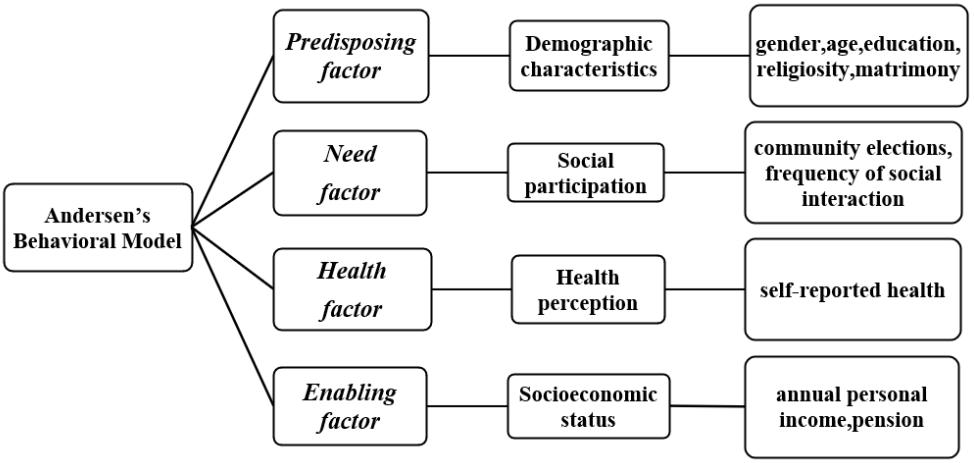

Figure 1. Influencing factors on SWB of the elderly under Andersen's behavioral model.

2.2. Research hypotheses

2.2.1. Predisposing factors

The SWB of older people is related to gender, age, marital status, education, and religious affiliation. Due to the influence of gender-based social norms in different societies, the ways in which individuals respond to negative experiences and employ coping strategies differ based on their gender (Alkan and Kavalci, 2023). Therefore, gender is considered an important predictor of behavior and well-being. Studies have shown that, older females have a lower SWB than older males (Li, 2007), and rural female older adults face the greatest spiritual vulnerability (Jiang and Chen, 2021). A U-shaped relationship exists between age and SWB -- youth and older adults have higher SWBs, while middle-aged individuals have the lowest SWB (Hu and Gao, 2013). In older people, widowhood is an inevitable and stressful event, which greatly reduces their social well-being (Cheng and Jiang, 2017). There was also an association between higher education levels and better SWB among older people (Dang and Sukontamarn, 2019), but not among Japanese or American older people (Nakagawa et al., 2017). According to a study using survey data from China's oldest-old, religious participation is negatively correlated with SWB (Brown and Tierney, 2009). In light of previous studies, we propose the following hypotheses.

- H1a: Elderly females have a lower SWB than elderly males.
- H1b: The SWB of elderly increases with age.
- H1c: The SWB of elderly with spouses is higher than that of those without spouses.
- H1d: Elderly people with high education levels have high SWB.
- H1e: SWB is better among the elderly without religious beliefs as opposed to those with religious beliefs.

2.2.2. Need factors

A social integration perspective suggests that individuals must adjust their social roles throughout their lives in order to maintain psychological well-being and social integration (Sandstrom and Dunn, 2014). During retirement, individuals are more likely to lose their originally formal roles (work roles) and take on new social roles, while engaging in social activities may provide a more reliable social integration

mechanism (Evandrou and Glaser, 2004). The elderly who participate in more social activities and spend more time on them may have access to more resources, feel more purposeful, and be more motivated to engage in health-promoting behaviors, all of which could result in better health and a higher level of SWB (Thomas, 2011). Referring to previous studies, social participation is a significant independent variable to test its influence on the SWB of older people. There are a variety of productive and non-productive activities that the elderly engage in, such as paid and unpaid work, visits to relatives and friends, group activities, and other forms of social interaction. Social participation occurs when such activities are carried out at the social level and in conjunction with others, so that the elderly can realize their own value in the process of social interaction. In this study, we use two questions in the questionnaire as proxy variables for social participation, "whether to participate in community elections" and "the frequency of social interaction." The second research hypothesis was proposed as:

H2: Elderly people with a high level of social participation have a stronger SWB than those with a low level of social participation.

2.2.3. Health factors

In this study, health factors were operationalized as self-reported health. In contrast to physician ratings, self-reported health measures a different aspect of health. It depends on one's hypothesis, which is subjective or perceived by the individual, not objective or actual (Jylhä, 2009). A moderate and robust relationship has been found between self-reported health and SWB in older adults (Steptoe et al., 2015). Elderly people's physical health is directly related to their daily activities. A poor physical condition will not only make daily activities more difficult, but also increase economic expenses, resulting in less SWB. We formed the third hypothesis:

H3: Elderly individuals with a high self-reported of health will have a higher SWB than those with a low self-reported of health.

2.2.4. Enabling factors

Enabling factors include income and endowment insurance. SWB is generally regarded as having a certain relationship to income (Cai and Park, 2016). The elderly will benefit greatly from a stable income or asset base when they lose their ability to participate in certain economic activities. Health conditions indirectly affect their SWB as a result of income inequality (Hu and Lu, 2012). Additionally, China's pension system is becoming increasingly accessible to both urban and rural residents. Are elderly people likely to experience an increase in SWB as a result? A fourth hypothesis is as follows:

H4: SWBs of elderly individuals with high incomes and pensions are higher than those with low incomes and no pensions.

3. Methods

3.1. Data

In this study, we analyzed the newly released data of Chinese General Social Survey in 2018 (CGSS). China's CGSS is a nationally comprehensive academic survey project. In this survey, detailed information on the attitudes, work, and

lifestyles of Chinese people is collected in both urban and rural areas. A comparative study of urban and rural areas would therefore benefit from this data set. In Article 2 of the Law on the Protection of the Rights and Interests of the Elderly in China, the elderly are defined as people over the age of 60. After limiting the sample to individuals aged 60 and over, we retained 4,415 valid observations. A total of 1763 urban residents (39.93%) and 2652 rural residents (60.07%) are included in the available samples. Urban and rural residents are classified according to China's registered household registration system.

3.2. Measures

3.2.1. Dependent variables

In this study, elderly SWB is the dependent variable. Generally, SWB was measured using a scoring method. We adopted the single question method in this research. The original question was, "Do you think you have a happy life in general?" Answers were scored as 1, 2, 3, 4, and 5 on a five-point Likert scale ranging from very unhappy, relatively unhappy, average, relatively happy, and very happy. Participants with higher scores have higher SWB levels.

3.2.2. Independent variables

Predisposing factors refer to a series of demographic characteristics including age (above 60), gender (male = 1, female = 0), whether the participant had a spouse (yes = 1, no = 0, "no" means never married, widowed, divorced, etc.), religious affiliation (has = 1, none = 0), and educational level (1 = under primary school, 2 = primary school, 3 = junior high school, 4 = high school, 5 = college degree or above). Among the enabling factors are two variables: personal income and pension insurance coverage. In the corresponding items, respondents were asked, "What was your total income last year?" and "Have you participated in basic pension insurance?" (yes = 1, no = 0). In order to conform to the normal distribution, annual personal income was modeled in logarithmic form. In the health factor, self-reported health status is assessed using a 5-point Likert scale ranging from 1 (very badly) to 5 (very well). A higher score indicates better health outcomes. They were combined and recoded as 1 (poor), 2 (average), and 3 (good). Need factors were measured based on the item, "Do you participate in the election activities of urban residents' committees/rural residents' committees? "and "How often have you participated in social activities in your free time over the past year??" On a 4-point Likert scale ranging from 1 (frequently) to 4 (never), interviewees reported voting in community elections (1 = yes/2 = no) and participating in social activities. **Table 1** shows statistics for all variables.

Table 1. Statistical table of variables.

Variables	Definition	Statistics	Distribution (%)
Household registration	1 = Agricultural	2652	60.07
	2 = Non-agricultural	1763	39.93
Gender	1 = Male	2104	47.66
	0 = Female	2311	52.34
Spouse	1 = Yes	3221	72.96

Table 1. (*Continued*).

Variables	Definition	Statistics	Distribution (%)
	0 = None	1194	27.04
Age	Derived by survey year minus the respondent's birth year	Mean:69.7 STD:7.49	60–104 years old
Education	1 = Uneducated 2 = Primary school 3 = Junior high school 4 = High school 5 = College degree or above	1174 1294 988 649 291	26.71 29.44 22.47 14.76 6.62
Religiosity	1 = Yes 0 = None	526 3889	11.91 88.09
Income	Personal annual income	Median: 23,571.6 Q1: 1440 Q3: 36,000	0–800000
Pension	1 = Yes	3713	84.1
	0 = None	702	15.9
self-reported health	1 = Poor	1377	31.19
	2 = Average	1255	28.43
	3 = Good	1783	40.39
Community elections	1 = Participated	2542	57.58
	0 = Not participated	1872	42.42
Social activities participation	1 = Frequently	1131	25.62
	2 = Sometimes	865	19.59
	3 = Rarely	1556	35.24
	4 = Never	863	19.55
SWB	1 = Very unhappy	52	1.18
	2 = Less happy	268	6.07
	3 = Average	500	11.33
	4 = Relatively happy	2591	58.69
	5 = Very happy	1004	22.74

3.3. Statistical analyses

Gender, spouse, religious affiliation, pension, and community elections were classified as dummy variables with reference groups of female, no spouse, no religious affiliation, and no political affiliation. Other variables, such as SWB, self-reported health, and participation in social activities, were also categorized into ordinal variables. Personal annual income remains a continuous variable. We used the t-test to analyze if there are differences in SWB of the elderly between urban and rural areas. To analyze the relationships between SWB and predisposing factors, enabling factors, need factors, and health factors, ordinal logistic regression models were used in the generalized linear method. Statistical significance was determined by a two-tailed P value of<0.05. We used STATA 14.0 to perform all statistical analyses.

4. Results

4.1. SWB differences between urban and rural elderly

In **Table 2**, the proportion of urban elderly residents who chose "relatively happy" and "very happy" was slightly higher than the rural population. In urban areas, the percentage of people who were "relatively happy" and "very happy" was approximately 85%, and the percentage of people who chose "unhappy" was 5.2%. In rural areas, about 78% of the elderly chose "relatively happy" or "very happy," while 8.6% chose "unhappy." Urban elderly had a slightly higher SWB than rural elderly. The t-test indicates that there is no significant difference in SWB between urban and rural elderly adults in China (**Table 3**).

Table 2. Proportions of SWB among the urban and rural elderly in China (%).

SWB	Urban residents	Rural residents
Very unhappy	0.62	1.55
Relatively unhappy	4.54	7.09
Average	9.53	12.52
Relatively happy	59.78	57.96
Very happy	25.52	20.89

Table 3. The differences in SWB of the elderly between urban and rural areas based on the t-test.

Group	Obs	Mean	Std.dev.
Urban	1763	3.879	0.8618
Rural	2652	3.988	0.7829
t	3.76		
p	0.058		

4.2. Influence factors of SWB among urban and rural elderly

We used ordinal logistic regression models in the generalized estimating equation method to estimate potential predictors of SWB in 4396 elderly. To form four models, we nested the variables in the samples of urban (1745 individuals) and rural (2651 individuals). Model (1) is a benchmark model containing predisposing factors only. In Model (2), the elderly' need factor was added to Model (1) to estimate its impact on SWB. Health factor were added in model (3). In Model (4), enabling factors were added to estimate their impact on the SWB of the elderly. **Table 4** reports the results of the regression.

SWB is positively and negatively influenced by several social-demographic variables. Using the benchmark model that only contains the predisposing factors, we find that gender, age, religious affiliation, and marital status all have a significant effect on SWB in the elderly. Specifically, the SWB for male elderly in urban and rural areas is lower than that for female elderly. The hypothesis 1a has not been verified. The SWB of the elderly increases with age, and hypothesis 1b is confirmed. Elderly people with a spouse have better SWB than those without a spouse. The hypothesis 1c

has been verified. According to this study, educational level does not appear to play a significant role. We have not verified hypothesis 1d. In rural areas, religious affiliation has a positive impact on elderly' SWB. Rural elderly with religious beliefs have higher SWB than those without. The hypothesis 1e has not been verified.

Table 4. Regression results of the nested model in urban and rural areas.

Independent variables	Urban residents				Rural residents			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Gender	−0.293***	−0.281***	−0.313***	−0.331***	−0.158*	−0.149*	−0.186**	−0.189**
	(0.100)	(0.101)	(0.102)	(0.102)	(0.0812)	(0.0816)	(0.0817)	(0.0820)
Age	0.0278***	0.0289***	0.0369***	0.0363***	0.0174***	0.0186***	0.0220***	0.0218***
	(0.0075)	(0.0077)	(0.0075)	(0.0077)	(0.0056)	(0.0056)	(0.0056)	(0.0056)
Education								
Primary	0.187	0.181	0.128	0.120	0.169*	0.152*	0.141	0.129
	(0.214)	(0.215)	(0.215)	(0.215)	(0.0909)	(0.0908)	(0.0909)	(0.0909)
Junior high	0.137	0.145	0.102	0.0627	0.223*	0.198*	0.161	0.101
	(0.204)	(0.205)	(0.205)	(0.206)	(0.118)	(0.120)	(0.120)	(0.122)
High school	0.0996	0.107	0.0333	0.0855	0.234	0.229	0.181	0.0646
	(0.208)	(0.209)	(0.210)	(0.212)	(0.163)	(0.165)	(0.169)	(0.173)
College or above	0.188	0.222	0.0892	0.0092	0.830**	0.889**	0.607	0.262
	(0.232)	(0.233)	(0.237)	(0.240)	(0.366)	(0.376)	(0.382)	(0.392)
Religious affiliation	0.284	0.281	0.294	0.294*	0.205*	0.209*	0.227**	0.239**
	(0.173)	(0.174)	(0.175)	(0.175)	(0.115)	(0.115)	(0.115)	(0.116)
Spouse	0.317***	0.321***	0.307***	0.300***	0.212**	0.200**	0.185**	0.184**
	(0.124)	(0.124)	(0.124)	(0.124)	(0.0929)	(0.0930)	(0.0936)	(0.0934)
Community elections		0.211	0.198	0.214*		0.190**	0.180**	0.185**
		(0.0929)	(0.0901)	(0.1096)		(0.0790)	(0.0794)	(0.0793)
Social participation								
Sometimes		−0.386***	−0.394***	−0.407***		−0.191*	−0.207*	−0.234**
		(0.131)	(0.132)	(0.132)		(0.115)	(0.117)	(0.117)
Rarely		−0.385***	−0.296***	−0.318***		−0.391***	−0.337***	−0.333***
		(0.128)	(0.129)	(0.129)		(0.095)	(0.0954)	(0.0959)
Never		−0.400**	−0.269*	−0.261*		−0.198*	−0.0630	−0.0515
		(0.174)	(0.177)	(0.177)		(0.112)	(0.113)	(0.113)
Self-reported health								
Average			0.632***	0.633***			0.287***	0.275***
			(0.145)	(0.145)			(0.100)	(0.0999)
Good			1.076***	1.078***			0.903***	0.884***
			(0.142)	(0.142)			(0.0929)	(0.0929)
Income				0.249***				0.747***
			(0.0805)					(0.0270)
Pension			0.210					0.275***

Table 4. (*Continued*).

Independent variables		Urban residents				Rural residents			
		Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
					(0.177)				(0.0977)
N	1763	1763	1763	1763	1763	2652	2652	2652	2652

* $P < 0.1$, ** $P < 0.05$, *** $P < 0.01$; the numbers in brackets are robust standard errors. The work status variable was referenced as "off-farm work", the educational level variable was referenced as "under primary school", the social activity variable as "never participate" and the self-reported health variable as "poor."

We added the need factors, which refer to the frequency of participating in social activities and community elections, to Model (2). The SWB of rural elderly is significantly affected by whether or not they participate in community elections. SWB was higher among individuals who participated in community elections. Participation in the community election has little effect on the SWB of urban elderly. Urban and rural elderly who frequently participate in social activities have better SWBs than those who never engage in social activities. Hypothesis 2 has been verified.

According to Model (3), rating their health as healthy was significantly associated with a better SWB than rating their health as poor. The SWB of urban elderly with average and high self-reported health was 1.89 and 2.93 times higher than those with poor self-reported health. In rural areas, the rates were 1.34 and 2.47, respectively. Hypothesis 3 is supported.

In model (4), annual income and endowment insurance variables are included, which have significant effects on rural samples. A higher level of SWB is associated with higher annual income for the rural elderly. Rural elderly with pension insurance have 1.3 times higher SWBs than those without. There is a significant impact of personal income on SWB in the urban sample, but endowment insurance is not significant. Clearly, endowment insurance is crucial for improving the SWB of rural elderly. Hypothesis 4 is validated.

5. Discussion

Based on the data of 2018 CGSS, our study finds that the proportion of urban elderly choosing "relatively happy" and "very happy" is about 85%, while the proportion in rural areas is about 78%. While the data of 2010 CGSS revealed that the proportion of urban elderly choosing "relatively happy" and "very happy" is about 75%, while the proportion in rural areas is about 69%. There has been a improvement in the SWB of elderly people in China. Economic development and the gradual implementation of livelihood policies have led to this inevitable result. We conducted a comparative study of the influencing factors of SWB among the elderly in rural and urban areas based on Andersen's behavioural model. According to the theoretical model, the predisposing factor, need factor, health factor, and enabling factor affect the SWB of the elderly. Personal income is the main factor influencing SWB of urban elderly, while pensions and social participation are key factors influencing SWB of rural elderly.

The SWB of elderly women is better than that of men, regardless of whether the samples are urban or rural. It might be because women are more likely to have strong

social support networks. Women tend to have closer relationships with their family and friends, and they are more likely to confide in others and seek emotional support. This social support can be a major source of SWB for women. Happiness increases with age, which is explained to some extent by the U-shaped theory of happiness, that is, the correlation between age and SWB is U-shaped. The majority of people are happy in the years leading up to adulthood, decline in middle age, then rise again after a midlife crisis and into old age (Galambos et al., 2020). Compared to elderly without spouses, those with spouses had higher SWB. Elderly people who are widowed are more likely to suffer from loneliness and depression (Yang, 2020). The presence of an "old companion" has a profound effect on someone's well-being as they grow older. Losing a spouse means losing some psychological support and companionship in daily life. The mental health of widowed older people needs to be highly valued in social support programs.

In this study, educational level does not seem to play a significant role, and such results may seem paradoxical. Higher educational levels are generally associated with wider SWBs. It is unclear how education relates to SWB, and reports of a negative association are common. Education is always associated with higher expectations in life. Consequently, education may lead to greater SWB only to the extent that it improves the ability to meet (or exceed) expectations (Kristoffersen, 2018).

According to previous research, religious affiliation is negatively associated with SWB. It is because older people are more inclined to seek spiritual consolation in religion when they experience unhappiness and misery (Zhang and Zhang, 2014). In our study, religious belief did not significantly impact SWB of urban older people, but positively impacted SWB of rural older people. China's religious culture and tradition are not strong, but in rural areas, the situation appears to be different. It has become more common for older people in rural China to practice religion in recent years. Approximately one in ten rural older people believe in religion, according to a 2016 survey conducted by the "Rural Elderly Religious Belief Project Team" in China (He, 2017). Particularly in rural China, there are more empty nests and older solitary people, and religion can help eliminate loneliness and fulfill spiritual needs (Roteet al., 2012). Therefore, religious belief can have a positive effect on SWB to a certain extent.

The enabling factors include annual personal income and pension insurance. There is a positive correlation between income level and SWB among older people in rural and urban areas. There was no significant association between pension insurance and SWB in the urban sample, but in the rural sample there was a significant association between pension insurance and SWB. In 2009, the Chinese government introduced the New Rural Social Pension Insurance (NRSPI) program (Shu, 2018). Rural Chinese have received pensions for the first time in history. In 2014, the State Council formally merged the NRSPI and the Urban Social Pension Insurance (USPI), which had previously been independent organizations. As a result, the scheme became known as the Residents' Social Pension Insurance Scheme (RSPI) (Stepan and Lu, 2016). Through RSPI, the gap between rural and urban pensioners has been narrowed, and rural residents' policy satisfaction has increased. As China's traditional family care for older people declines, pension insurance provides a stable guarantee for the lives of rural older people. Probably, financial independence implies autonomy, and their SWB is directly related to it. In China, it is therefore imperative to increase

pension subsidies, support disadvantaged older people, and create a more conducive environment for social and cultural activities (Zheng and Fang, 2018).

Both urban and rural samples show positive effects of health factors on SWB. SWB is higher in older people with high self-reported health. As the self-concept hypothesis indicates, self-reported health is stable, and it reflects one's established beliefs about health (Siahpush et al., 2008). The older people will be more satisfied with their lives if their self-reported health is better. Health is happiness, as the Chinese saying goes. The top priority in coping with the aging population is improving the health support system for older people. However, there is a lack of quick and adequate access to medical services for older people living in remote, poor, rural areas. China has a social phenomenon known as "the difficulty of seeing a doctor" (Cheng and Yan, 2021). As a result, relevant departments need to actively provide affordable, quality, convenient medical and health care to older people living in rural areas. Health is dynamic. A multi-sectoral strategy is imperative to protect the older people's health, as individual, family, and community well-being are all influenced by a variety of circumstances (Bayrakçeken et al., 2023).

A programmatic statement guiding the work on aging at the current stage was issued by the Chinese government in 2021 entitled "Opinions on Strengthening the Work on Aging in the New Era.". It emphasizes that the Chinese government will integrate "Active Aging" and "Healthy Aging" into the whole process of economic development, and strengthen the promotion and education of older people's health knowledge. Meanwhile, the Chinese government will increase early screening, intervention and classification of older people's chronic diseases, and improve nutrition, dementia prevention, and psychological care. Assessing the needs of older people, promoting the "Medical and Nursing Integration" system, and improving the health service and management levels for older people.

Need factors have positive impact on the SWB of older people. Participation in community elections and social activities is associated with a better SWB, especially among the older people living in rural areas. Probably due to the more boring lifestyle of elderly people in rural areas than in urban ones. Participation in social activities can help the elderly meet their needs and values, build friendships, and feel positive emotions, thus enhancing their well-being (Brajša-Žganec et al., 2010). To create a participation platform and expand the channels for the elderly to participate in society, the government should work with urban and rural community or social service institutions. Currently, China has established projects such as "White Hair Action", "Mutual Assistance for the Elderly", "Reemployment of the Elderly", and "Time Bank" to promote social inclusion among the elderly. In the future, the Chinese government should formulate more targeted and specific measures to promote the full participation of the elderly in society, especially in rural areas. The government should also gradually equalize public services for the elderly in rural and urban areas.

6. Strengths and limitations

With Chinese large scale social survey samples, this study is one of the few attempts to identify factors influencing subjective well-being among urban and rural elderly. In Anderson's behavior model, all possible socioeconomic factors, health,

social participation, economic, and policy factors were incorporated into analysis models based on face-to-face surveys. It can facilitate a comprehensive understanding of SWB determinants. Based on our findings, the gap between urban and rural elderly 's SWB is narrowing. There was a significant correlation between SWB and self-reported health, income, pension, and social participation. The findings may also apply to other populations in transition, especially in East Asia and Southeast Asia. Culturally and contextually, the situation is similar to that in China, such as the breakdown of traditional family structures and the improvement of social security (Yang and Gu, 2019).

Despite many efforts to ensure the trustworthiness, there are still several limitations. Those strong predictors of SWB among elderly people might interact with other variables, resulting in overestimation of their effect on SWB. Further exploration of these relevant interactions will lead to more realistic and robust predictions. In addition, some factors were not considered in the analysis. As an example, family assets, number of family members, number of children, etc. Future studies can examine the effects of these factors. Furthermore, there is a possibility of detection bias since most variables were derived from the report of the interviewee.

7. Conclusions

Aging is an irresistible trend. Increasing the quality of life for the elderly is a topic of attention. SWB refers to the overall evaluation of elderly people's living conditions, which is an important indicator of their quality of life. Consequently, improving SWB is vital to achieving healthy aging for the elderly. As a result of using the national authoritative survey data in China and Andersen's behavioural model, we observed that SWB in the elderly is influenced by a wide variety of complex factors, including predisposing factors, enabling factors, need factors, and health factors. A number of variables are involved, such as gender, age, marriage, education, religious affiliation, self-reported health, participation in social activities and elections, income, pension, and so forth. An analysis of the influencing factors of SWB in urban and rural elderly indicates that enabling factors like personal income are mainly responsible for the SWB of urban elderly, whereas need factors such as social participation are mainly responsible for the SWB of rural elderly. In general, the SWB of urban and rural elderly has improved. We recommend special attention be given to the well-being of widowed elderly people, those with low self-reported health, without pension insurance, with low income, and with fewer social contacts. Sport activities, leisure activities, financial support, and medical services can all contribute to the well-being of the elderly.

Author contributions: Conceptualization, CF; methodology, CF; software, CF; validation, CF and RC; formal analysis, CF; investigation, CF; resources, CF; data curation, CF; writing—original draft preparation, CF and RC; writing—review and editing, RC; visualization, CF; supervision, RC; project administration, CF; funding acquisition, CF. All authors have read and agreed to the published version of the manuscript.

Availability of data and materials: The datasets analyzed during the study are available from the corresponding author by reasonable request.

Ethics approval and consent to participate: This study was approved by the ethics committee of Ocean University of China. All participants were informed of the purpose and content of the study and provided written informed consent. Informed consent was obtained from all subjects and their legal guardian(s)/Next of kin for uneducated participants. All methods were carried out in accordance with relevant guidelines and regulations.

Conflict of interest: The authors declare no conflict of interest.

Abbreviations

CMCA	China's Ministry of Civil Affairs
CNCA	China National Commission on Aging
SWB	Subjective well-being
RIH	relative income hypothesis
QOL	quality of life
NRSPI	New Rural Social Pension Insurance
USPI	Urban Social Pension Insurance
RSPI	Residents' Social Pension Insurance

References

Alkan, O., & Kavalci, K. (2023). Gender differences in happiness during COVID-19 pandemic: Evidence from Türkiye. Psychiatry and Behavioral Sciences, 13(3), 153. https://doi.org/10.5455/pbs.20230512053548

Andersen, R. M. (2008). National health surveys and the behavioral model of health services use. Med Care, 46(7), 647-653.

Andersen, R., & Newman, J. F. (1973). Societal and Individual Determinants of Medical Care Utilization in the United States. The Milbank Memorial Fund Quarterly. Health and Society, 51(1), 95. https://doi.org/10.2307/3349613

Baernholdt, M., Hinton, I., Yan, G., et al. (2011). Factors associated with quality of life in older adults in the United States. Quality of Life Research, 21(3), 527–534. https://doi.org/10.1007/s11136-011-9954-z

Bai, Z. Y. (2017). Income threshold, Relative Deprivation and Happiness of the Elderly. Finance & Trade Economics, (5), 20-33.

Bayrakçeken, E., Alkan, Ö., & Abar, H. (2023). Psychological Help-Seeking Status for Living with Mental Health Conditions in Türkiye: Using a Multivariate Probit Model. Healthcare, 11(21), 2837. https://doi.org/10.3390/healthcare11212837

Bloom, D. E., Canning, D., & Fink, G. (2010). Implications of population ageing for economic growth. Oxford Review of Economic Policy, 26(4), 583–612. https://doi.org/10.1093/oxrep/grq038

Brajša-Žganec, A., Merkaš, M., & Šverko, I. (2010). Quality of Life and Leisure Activities: How do Leisure Activities Contribute to Subjective Well-Being? Social Indicators Research, 102(1), 81–91. https://doi.org/10.1007/s11205-010-9724-2

Brown, P. H., & Tierney, B. (2009). Religion and subjective well-being among the elderly in China. The Journal of Socio-Economics, 38(2), 310–319. https://doi.org/10.1016/j.socec.2008.07.014

Cai, S., & Park, A. (2016). Permanent income and subjective well-being. Journal of Economic Behavior & Organization, 130, 298–319. https://doi.org/10.1016/j.jebo.2016.07.016

CECN. (2019). Less than one-third of the elderly are mentally healthy. The National Health Commission promotes the elderly psychological care project. Available online: http://www.ce.cn/cysc/yy/hydt/201906/11/t20190611_32321035.shtml (accessed on 5 January 2024).

Chen, X., Yang, H. Y. (2020). Research on the impact of social comparison and time comparison on the subjective well-being of the elderly. Journal of Huazhong Agricultural University (Social Science Edition). (1),102-110.

Cheng, J. F, Jiang, Q. B. (2017). Research on widowed elderly subjective Well-being: Gender and Urban-rural Differences. Population and Development, (4), 59-69.

Cheng, G., & Yan, Y. (2021). Sociodemographic, health-related, and social predictors of subjective well-being among Chinese oldest-old: a national community-based cohort study. BMC Geriatrics, 21(1). https://doi.org/10.1186/s12877-021-02071-7

Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative Income, Happiness, and Utility: An Explanation for the Easterlin Paradox and Other Puzzles. Journal of Economic Literature, 46(1), 95–144. https://doi.org/10.1257/jel.46.1.95

Coşkun, H., Yildiz, I., & Alkan, Ö. (2023). Prevalence and predictors of psychological assistance services for older individuals in Turkish society. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.1060845

Dang, T. N. H., & Sukontamarn, P. (2019). Education and Subjective Well-Being among Older Vietnamese: Exploring Gender Differences. Journal of Population and Social Studies, 28(1), 22–37. https://doi.org/10.25133/jpssv28n1.002

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. American Psychologist, 55(1), 34–43. https://doi.org/10.1037/0003-066x.55.1.34

Diener, E., Suh, E. M., Lucas, R. E., et al. (1999). Subjective well-being: Three decades of progress. Psychological Bulletin, 125(2), 276–302. https://doi.org/10.1037/0033-2909.125.2.276

Evandrou, M., & Glaser, K. (2004). Family, work and quality of life: changing economic and social roles through the lifecourse. Ageing and Society, 24(5), 771–791. https://doi.org/10.1017/s0144686x04002545

Ferlander, S. (2007). The Importance of Different Forms of Social Capital for Health. Acta Sociologica, 50(2), 115–128. https://doi.org/10.1177/0001699307077654

Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. Journal of Public Economics, 89(5–6), 997–1019. https://doi.org/10.1016/j.jpubeco.2004.06.003

Galambos, N. L., Krahn, H. J., Johnson, M. D., et al. (2020). The U Shape of Happiness Across the Life Course: Expanding the Discussion. Perspectives on Psychological Science, 15(4), 898–912. https://doi.org/10.1177/1745691620902428

González-Herero, V., & García-Martín, M. Á. (2012). Personality, Activities, and Well-Being: A Study Based on Women in Late Adulthood. Journal of Women & Aging, 24(2), 152–168. https://doi.org/10.1080/08952841.2012.639662

He, Y. F. (2017). The Religious Belief of the Rural Elderly-Based on the survey and research of 4328 elderly people in 293 villages in China. Social Science Weekly, 1573.

Heider, D., Matschinger, H., Müller, H., et al. (2014). Health care costs in the elderly in Germany: an analysis applying Andersen's behavioral model of health care utilization. BMC Health Services Research, 14(1). https://doi.org/10.1186/1472-6963-14-71

Herero, V. G., & Extremera, N. (2010). Daily life activities as mediators of the relationship between personality variables and subjective well-being among older adults. Personality and Individual Differences, 49(2), 124–129. https://doi.org/10.1016/j.paid.2010.03.019

Hochhausen, L., Le, H.-N., & Perry, D. F. (2009). Community-Based Mental Health Service Utilization Among Low-Income Latina Immigrants. Community Mental Health Journal, 47(1), 14–23. https://doi.org/10.1007/s10597-009-9253-0

Hu, H., Lu, Y. (2012). Income inequality, health and subjective well-being of the elderly. China Soft Science, (11), 41-56.

Hu, H. W, Gao, M. (2013). Analysis on the Influencing Factors and Improvement path of the Elderly subjective Well-being: Based on the Survey of the Living Conditions of the Elderly in Urban and rural China. Journal of Jiangsu University (Social Science Edition), (4), 48-54.

Huang, W.-H., Lin, Y.-J., & Lee, H.-F. (2019). Impact of Population and Workforce Aging on Economic Growth: Case Study of Taiwan. Sustainability, 11(22), 6301. https://doi.org/10.3390/su11226301

Jiang, Q. L., Chen, Z. H. (2021). The active aging of silver haired surfers: a study on the mechanism of Internet use to improve the subjective well-being of the elderly. Modern Communication, (12), 41-48.

Jylhä, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. Social Science & Medicine, 69(3), 307–316. https://doi.org/10.1016/j.socscimed.2009.05.013

Keyes, C. L. M. (2006). Subjective Well-Being in Mental Health and Human Development Research Worldwide: An Introduction. Social Indicators Research, 77(1), 1–10. https://doi.org/10.1007/s11205-005-5550-3

Kristoffersen, I. (2018). Great expectations: Education and subjective wellbeing. Journal of Economic Psychology, 66, 64–78. https://doi.org/10.1016/j.joep.2018.04.005

Li, D. M. (2007). Subjective well-being and its influencing factors in Chinese elderly women. Chinese Journal of Gerontology, (8), 614-617.

Li, Y., Lu, S. (2017). Theoretical Construction and Analysis of The Evolution of Andersen model. Chinese Health Service Management, (5), 324-327.

Li, Z. L, Yu, Y., Qin, S. X. (2022). Study on the current situation of subjective well-being of the elderly with chronic diseases in rural areas of southern Guizhou and its influencing factors. Nursing Research, 36(2), 293-298.

Liu, Y. W. (2016). The Ruin of Rural Family Pension-The perspective of rural elderly suicide. Journal of Wuhan University Humanities Edition, (4), 489-492.

Lou, J. Y., Zhang, X. S., Zheng, Q. C. (2019). Social Capital, health status and subjective well-being of the elderly: An analysis based on CGSS2010 and CGSS2015 Data. Journal of Fujian Agriculture and Forestry University (Philosophy and Social Sciences Edition), (2), 69-78.

Nakagawa, T., Cho, J., Gondo, Y., et al. (2017). Subjective well-being in centenarians: a comparison of Japan and the United States. Aging & Mental Health, 22(10), 1313–1320. https://doi.org/10.1080/13607863.2017.1348477

Pinquart, M., & Sörensen, S. (2000). Influences of socioeconomic status, social network, and competence on subjective well-being in later life: A meta-analysis. Psychology and Aging, 15(2), 187–224. https://doi.org/10.1037/0882-7974.15.2.187

Qi, S. W., Zhou, S. F. (2010). The Effects of income, health and medical insurance on happiness of the elderly. Journal of Public Management, (1), 100-107.

Rote, S., Hill, T. D., & Ellison, C. G. (2012). Religious Attendance and Loneliness in Later Life. The Gerontologist, 53(1), 39–50. https://doi.org/10.1093/geront/gns063

Sandstrom, G. M., & Dunn, E. W. (2014). Social Interactions and Well-Being. Personality and Social Psychology Bulletin, 40(7), 910–922. https://doi.org/10.1177/0146167214529799

Shu, L. (2018). The effect of the New Rural Social Pension Insurance program on the retirement and labor supply decision in China. The Journal of the Economics of Ageing, 12, 135–150. https://doi.org/10.1016/j.jeoa.2018.03.007

Siahpush, M., Spittal, M., & Singh, G. K. (2008). Happiness and Life Satisfaction Prospectively Predict Self-Rated Health, Physical Health, and the Presence of Limiting, Long-Term Health Conditions. American Journal of Health Promotion, 23(1), 18–26. https://doi.org/10.4278/ajhp.061023137

Stepan, M., & Lu, Q. (2016). The Establishment of China's New Type Rural Social Insurance Pension: A Process Perspective. Journal of Current Chinese Affairs, 45(2), 113–147. https://doi.org/10.1177/186810261604500205

Steptoe, A., Deaton, A., Stone, A. A. (2015). Subjective well-being, health, and ageing. Lancet.385(9968):640-648. https://doi.org/10.1016/S0140-6736(13)61489-0

Tao, Y. C., Li, W. G. (2017). The Influence of leisure activities and self-assessment of health on subjective well-being of elderly. Journal of Xihua University (Philosophy and Social Sciences edition), (6), 71-79.

The Ministry of Civil Affairs. (2022). Bulletin of the Seventh National Population Census (No.5). Available online: http://www.stats.gov.cn/tjsj/zxfb/202105/t20210510_1817181.html (accessed on 5 January 2024).

Thomas, P. A. (2011). Gender, social engagement, and limitations in late life. Social Science & Medicine, 73(9), 1428–1435. https://doi.org/10.1016/j.socscimed.2011.07.035

Travers, J. L., Hirschman, K. B., & Naylor, M. D. (2020). Adapting Andersen's expanded behavioral model of health services use to include older adults receiving long-term services and supports. BMC Geriatrics, 20(1). https://doi.org/10.1186/s12877-019-1405-7

Wang, H. (2015). Research on subjective well-being of the Elderly in China: Origin, Status and Direction. Northwest Population Journal, (5), 62-66.

Wang, W. (2013). A Study on suicide among the elderly population in China. Population and Development, (1), 83-89.

Wu, J. J. (2012). The Influence of urban elderly volunteer activities on their subjective well-being: Based on a Survey in Chaoyang District, Beijing. South China Population, (5), 24-31.

Wu, X, Li, J., Wang, L. (2010). Analysis of depression symptoms in Chinese elderly population. Population Journal, (5), 88-98.

Xu, P., Zhou, C. C. (2014). The Influencing factors of Subjective well-being of the Elderly in China: An Empirical analysis based on the Andersen's Health Behavior Model. Social Security Studies, (2), 43-52.

Yang, F. (2020). Widowhood and loneliness among Chinese older adults: the role of education and gender. Aging & Mental Health, 25(7), 1214–1223. https://doi.org/10.1080/13607863.2020.1732293

Yang, F., & Gu, D. (2019). Predictors of loneliness incidence in Chinese older adults from a life course perspective: A national longitudinal study. Aging & Mental Health, 24(6), 879–888. https://doi.org/10.1080/13607863.2018.1558174

Yang, H., Wu, Y., Lin, X., et al. (2021). Internet Use, Life Satisfaction, and Subjective Well-Being Among the Elderly: Evidence From 2017 China General Social Survey. Frontiers in Public Health, 9. https://doi.org/10.3389/fpubh.2021.677643

Zeng, Y., Feng, Q., Hesketh, T., et al. (2017) Improvements in survival and activities of daily living despite declines in physical

and cognitive functioning among the oldest old in China—evidence from a cohort study. Lancet, 389, 1619-29. https://doi.org/10.1016/S0140-6736(17)30548-2

Zhang, Z., & Zhang, J. (2014). Social Participation and Subjective Well-Being Among Retirees in China. Social Indicators Research, 123(1), 143–160. https://doi.org/10.1007/s11205-014-0728-1

Zheng, X. D., Fang, X. M. (2018). The Social Pension Scheme and the Subjective Well-being of the Elderly in Rural China. Journal of Finance and Economics, 44(9), 80-94.