

RESEARCH ARTICLE

The impact of labor participation on older adults' well-being in active aging: A cross-sectional study in Hebei Province, China

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ABSTRACT

The active aging model has sparked discussions about improving the participation of older adults in the workforce and their overall well-being. This has led to a greater emphasis on providing continuous learning opportunities, offering flexible work arrangements, and creating health programs specifically tailored for this demographic. Therefore, the main purpose of this study is to investigate the association between labor participation and subjective well-being and to identify important factors that influence subjective well-being in older adults. The measurement of subjective well-being encompassed two key dimensions (i.e., life satisfaction and depression). The study recruited 202 elderly individuals in Hebei Province, China, through a cross-sectional method. Our findings revealed that the percentage of elderly individuals participating in the workforce was relatively low. There was a notable positive association between labor participation and life satisfaction. Additionally, labor participation and educational attainment are found to be significantly associated with life satisfaction among older adults. In summary, the findings of this study are essential for providing ideas to promote healthy aging and optimize the allocation of human resources.

Keywords: labor participation; subjective well-being; life satisfaction; active aging; older adults

1. Introduction

The population of people aged 60 and above in China reached 296.97 million by the end of 2023, accounting for 21.1% of the total population^[1]. Among this group, 216.76 million people were aged 65 and above, representing 15.4% of the total population. These statistics indicate a growing aging population in China, which may lead to a significant labor shortage affecting economic and social development in the future. The concept of active aging, proposed by the World Health Organization (WHO), encourages older adults to actively participate in economic, social, and cultural activities^[2]. These activities are believed to promote the well-being of older adults and reduce the burden of dependency on society^[3].

Research has shown that factors such as financial stability, having a sense of purpose, social engagement, and mental stimulation play a significant role in promoting the well-being of older adults within the framework of active aging^[4-6]. Subjective well-being, as defined by Diener et al.^[7], refers to an individual's overall assessment of their quality of life based on their own perceptions and judgments. The

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“Opinions on accelerating the development of community rehabilitation services for mental disorders” issued in 2017 highlighted the importance of focusing on the mental health of older adults to promote their subjective well-being and ensure they can maintain a positive mindset in their later years^[8]. This statement shows that the Chinese government recognizes the importance of prioritizing the well-being of older adults. At present, China's welfare index for the elderly is still at a lower level than that of developed countries, especially among rural and low-income groups. Study have found that older people's participation in work can effectively improve mental health and life satisfaction^[9]. Therefore, the significance of this study is to explore the impact of older adult labor participation on subjective well-being, particularly in the context of active aging.

Therefore, the purpose of this present study is to expand on existing research in active aging. Hebei was chosen for this study for specific reasons. Firstly, Hebei is one of the provinces in China with a significant aging population^[10]. Since entering an ageing society in 1999, the rate of population ageing in Hebei Province has accelerated year by year, and the proportion of the elderly population has approached the national level. However, there are also some differences between Hebei Province and the national average, particularly in terms of urban-rural differences and labor market participation, which makes Hebei Province a unique case for this study of the relationship between labor participation and subjective well-being among the elderly. Furthermore, communities are now working towards building age-friendly environments that encourage social engagement and independence among the elderly. Hence, the aim is to answer the following research questions: (1) What is the level of subjective well-being? (2) Are there any associations between labor participation and subjective well-being? and (3) Which factors are the most significant predictors of subjective well-being? This paper is structured into several sections. First, it includes a review of relevant literature on subjective well-being and its association with labor participation. This is followed by research methodology, results, discussion, and conclusion.

2. Literature review

2.1. Research on subjective well-being

Research on subjective well-being initially originated in the field of psychology and has since expanded from the individual level to the societal level^[11]. According to social psychologist Diener^[12], subjective well-being comprises two fundamental components which are cognitive and affective. Cognitive aspects include people's satisfaction with life, while the affective component encompasses both positive (e.g., pleasantness and happiness) and negative emotions (e.g., sadness, depression, and anxiety). Furthermore, the measurement of subjective well-being has evolved. Diener et al.^[7] developed the Satisfaction with Life Scale (SWLS) to assess subjective well-being, consisting of five items on a seven-point scale, which has been widely used due to its reliability and validity across different age groups^[13].

Researchers in the field of subjective well-being have identified various factors that influence subjective well-being. Demographic factors such as age, gender, income, education, and marital status have been highlighted as particularly significant in this regard. For example, Tang^[14] identified that age was a significant factor for subjective well-being, noting that the subjective well-being of older adults in his study does not tend to decrease with age. In fact, the older adults in the senior age group tend to exhibit higher subjective well-being compared to other age groups. Additionally, family-related factors, such as marital status and having children, also play a role. Ma^[15] observed that older adults with partners tend to have higher subjective well-being, the quality of the relationship between dependent children and elderly parents also affects the well-being of older adults^[16]. While Huang^[17] found that higher educational attainment has a positive impact on individuals' well-being over time. Wang and Sohail^[18] explored the effects of education

on well-being in China, highlighting that both short- and long-term improvements in subjective well-being can result from higher education.

2.2. Research on labor participation and subjective well-being

The existing body of research on labor participation of elderly in China has primarily focused on retirement and re-employment. Several studies have investigated the consequences of retirement, with some indicating a detrimental effect on mental health^[19-21]. Pinguart and Schindler^[22] have noted that individuals prefer to have the autonomy to actively choose and control their retirement timing, which significantly impacts their well-being. In conjunction with China's plan to delay the retirement age, retirement-related issues have garnered significant attention among Chinese scholars^[23]. Liu and Gong^[24] indicated that retirement can alleviate the burden of older adults with heavy workloads, thereby improving their well-being. On the other hand, Huang^[25] found that the loss of personal identity and changes in social life post-retirement might pose adaptation challenges and reduce life satisfaction.

An empirical study by Lu and Zhang^[26] highlighted the standard of living and sense of economic security may probably decline after retirement due to decrease in income. The researchers found that re-employment can alleviate the psychological impact during the early stages of retirement and boost subjective well-being. He^[27] arrived at similar findings, indicating that re-employment after retirement assists older adults in adjusting to lifestyle changes, maintaining social connections, and improving their income, thereby improving their well-being. Wang and Zeng^[28] found in their research that the impact of well-being after retirement varies across groups. Among older adults who retired after reaching retirement age, they reported a higher subjective well-being. Nevertheless, among those who retired early, retirement did not significantly enhance their subjective well-being. This finding suggests that the timing of retirement may have a significant impact on the well-being of the older adults. Another empirical study by Huang and Lv^[29] indicated that labor participation after retirement negatively impacts the life satisfaction of older adults, with this effect being particularly prominent among older women. This may be related to factors such as the declining health of older women and their greater dependence on family. These factors work together to make women's labor participation after retirement likely to bring more psychological burdens and affect their overall life satisfaction. At the same time, some scholars have found that there is a significant positive correlation between labor participation and subjective well-being among the elderly^[30], while other studies have pointed out that labor participation may have an impact on happiness in different social and cultural contexts. There are differences in the impact^[31].

In summary, labor participation is significantly associated with the well-being of older adults in the context of aging. However, there is currently a lack of unified theoretical framework and clear empirical results on the relationship between labor participation and subjective well-being of the elderly. This research gap demonstrates the need to further explore the relationship between the two in order to provide policymakers with more targeted recommendations and interventions.

3. Methodology

3.1. The data

For this study, data is mainly obtained from an online survey conducted between May and June 2024 in three urban areas of Hebei city namely Shijiazhuang, Baoding, and Chengde. Our online survey is a cross-sectional study aiming to profile individuals based on demographic characteristics, labor participation, and subjective well-being. In this study, the sampling system utilized a probability proportionate to size (PPS) sampling for random sampling to ensure that the findings are representative of the participating

municipalities. Sampling was done gradually according to the PPS framework. The first level was district-level sampling, the second level was street-level sampling, and the third level was neighborhood committee-level sampling, the fourth level is the household level or elderly sampling, in which the elderly respondents to the survey are identified on a completely randomized basis among the selected community councils.

During the data collection process, questionnaires covering labor participation, subjective well-being and related demographic information were designed to facilitate quantitative analysis and in-depth understanding. Standardized scales (e.g., Subjective Well-Being Scale and Labor Participation Scale) were used to ensure consistency and comparability of data. In addition, the questionnaire was pre-surveyed to test its validity and reliability to ensure that it could accurately reflect the real situation of the respondents in the formal survey.

3.2. Demographic characteristics

Table 1 shows the demographic characteristics of the participants in the study, including age, gender, education, health condition, and monthly income. The average age of the respondents was 65 years old, with the majority in the age range of 60 to 65 years old (66.34%). Regarding overall health, most respondents considered themselves as basically healthy (55.40%) and very healthy (32.70%), indicating a relatively healthy overall health status. Only a small percentage of respondents reported being unhealthy (11.90%). In terms of gender, 121 respondents (59.90%) were male, and 81 (40.10%) were female. As for education level, most respondents received education at a high school level or above (80.70%), followed by middle school (11.40%), primary school or below (6.90%), and being illiterate (1%). Lastly, the average monthly income of respondents was RMB 5,638.05, with the majority earning between RMB 2,001 and RMB 6,000 (54.46%).

Table 1. Demographic characteristic of participants ($N=202$).

Variable	n	%	Mean	SD
Gender				
Male	121	59.90		
Female	81	40.10		
Age			64.85	5.46
60-65	134	66.34		
66-70	47	23.26		
71-75	8	3.96		
76-80	9	4.46		
81-85	4	1.98		
Health condition				
Very healthy	66	32.70		
Basically healthy	112	55.40		
Unhealthy but able to take care of yourself	23	11.40		
Unable to take care of yourself	1	0.50		
Education level				
Illiterate	2	1.00		
Primary school and below	14	6.90		
Middle school	23	11.40		

Variable	n	%	Mean	SD
High school	67	33.20		
College and above	96	47.50		
Monthly income			5638.05	4262.16
0-2000	25	12.38		
2001-4000	53	26.24		
4001-6000	57	28.22		
6001-8000	36	17.82		
8001-10000	29	14.35		
>10000	2	0.99		

Table 1. (Continued).

3.3. Labor participation

We utilized question from the Chinese Family Panel Study (CFPS) questionnaire, which was executed by the Chinese Center for Social Science Surveys (ISSS) at Peking University, to assess labor participation^[32]. The question asked was, "Did you work for at least one-hour last week? (Wage-earning jobs, self-employment/private activities are considered work, but not household chores and voluntary work at home)." Participants responded with either "yes" or "no". Those who answered "yes" were regarded as part of the labor force and were given a value of 1, while those who answered "no" were considered as not participating in the labor force and assigned a value of 0.

3.4. Subjective well-being

3.4.1. Satisfaction with life scale (SWLS)

In this present study, the SWLS was used to measure participant's life satisfaction. The SWLS scale developed by Diener et al.^[7], is widely used to measure life satisfaction. It consists of five items, such as "My life is close to my ideal" and "I am satisfied with my life". These items are rated on a seven-point scale from 1 (strongly disagree) to 7 (strongly agree). In this study, the mean is calculated using the sum of the individual items in the scale. The scale has good reliability and is applicable to the older adult population in China^[33]. The current study yielded a Cronbach's alpha value of 0.95 for the SWLS.

3.4.2. Center of epidemiologic studies depression scale, 10-item version (CES-D-10)

The CES-D-10 scale, developed by Andresen et al.^[34], is an important tool for assessing depressive tendencies in older adults. It measures the respondent's self-reported mood state over the past week. Each question on the scale offers 4 options that correspond to different levels of depression, typically scored from 0 (rarely or none of the time/less than 1 day) to 3 (most of the time/5-7 days). Higher scores indicate a higher risk of depression. In this study, the mean is calculated using the sum of the individual items in the CES-D-10 scale. The reliability of this scale has been widely validated and it is suitable for use with older adult populations^[35]. The CES-D-10 in this present study yielded a Cronbach's alpha value of 0.90.

4. Result

4.1. Labor participation

We used the SPSS statistical software package version 29 for all analyses in this study. As shown in **Table 2**, out of the 202 respondents, about 42% of them actively participated in the workforce, indicating a certain level of engagement. However, it is notable that many of the respondents in this study were not

involved in the labor force. This sheds light on the lack of motivation and opportunity among older adults in China to participate in the workforce and highlights the need to address the insufficient supply of older labor. According to Yang and Shi ^[36], the period from 1990 to 2015 exhibited consistently low employment rates for older adults in China. The employment rate for individuals aged 60 and above was below 5 percent, and for those aged 65 and above, it remained below 4 percent. This situation indicates a missed opportunity to fully utilize the valuable human resources of the elderly .

Table 2. Descriptive analysis of participants' labor participation ($N=202$).

Variable	<i>n</i>	%
Labor Participation		
Yes	84	41.6
No	118	58.4

4.2. Level of subjective well-being

Table 3 illustrates the subjective well-being levels measured by two different scales. Firstly, by using the SWLS scale, most respondents (64.36%) reported a moderate level of life satisfaction, followed by high level (16.83%), and low level (18.81%). When using the CES-D-10 scale, it was found that 56.93% of the respondents reported a moderate level of depression, 23.27% reported a low level, and 19.80% reported a high level. These findings suggest that while the percentage of respondents generally have a low risk of depression and a relatively good in life satisfaction, there is still a need for intervention programs, especially for those with high-risk depression indicators.

Table 3. Descriptive statistic of subjective well-being ($N=202$).

Variable Indicator	<i>n</i>	%	Mean	<i>SD</i>	Min	Max
SWLS			21.58	6.20	5	35
Low (≤ 16)	38	18.81				
Moderate (17-28)	130	64.36				
High (≥ 29)	34	16.83				
CES-D-10			8.02	6.92	0	28
Low (≤ 2)	47	23.27				
Moderate (3-12)	115	56.93				
High (≥ 13)	40	19.80				

4.3. Associations between labor participation and subjective-well-being.

We used a multiple regression analysis to determine the predictors of subjective well-being. The objective was to examine associations between labor participation and subjective well-being as well as whether a set of predictor variables comprising demographic characteristics and labor participation could be used to predict the probability of subjective well-being. The two dimensions of subjective well-being had separately analyzed as dependent variables in the regression model (i.e., life satisfaction and depression). We selected age, gender, education, monthly income, and labor participation as the independent variables. Prior to multiple regression analysis, we defined the following dummy variables as a reference for demographic characteristics: gender (0 = male, 1 = female), education level (0 = below high school, 1 = high school and above), and labor participation (0 = no, 1 = yes). Age and monthly income as ratio variable. The results are presented as below:

4.3.1. Life satisfaction (SWLS scale)

In **Table 4**, the results of a regression analysis examining the relationship between labor participation, demographic characteristics, and life satisfaction are presented. The analysis showed that model 1 was highly significant ($p < 0.001$), indicating a statistically significant relationship. This means that labor participation has a significant positive effect on the life satisfaction of older adults, with a regression coefficient of 0.93. In other words, higher labor participation is associated with greater life satisfaction among older adults. The coefficient of determination (R^2) for the model was 0.86, indicating that 86% of the variance in life satisfaction can be explained by labor participation.

Table 4. Stepwise multiple regression analysis of life satisfaction ($N=202$).

Predictor	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	$R^2/\Delta R^2$
Model 1						0.86/0.86
Labor Participation	11.68	0.33	0.93	35.81	.000***	
Model 2						0.87/0.87
Labor Participation	11.58	0.44	0.92	26.10	.000***	
Age	0.05	0.03	0.04	1.46	0.146	
Gender	0.27	0.41	0.02	0.65	0.517	
Education	1.42	0.45	0.09	3.12	0.002**	
Monthly Income	0.00	0.00	0.00	0.14	0.892	

Note: $p^{***} < 0.001$, $p^{**} < 0.01$.

Regression Method: OLS (Ordinary Least Squares) Regression

The results of the overall regression significance test for Model 2 indicate that the regression model is statistically significant ($F = 268.88$, $p < 0.001$), i.e., the independent variables in the model are able to significantly explain the variation in the dependent variable. Among the five predictors examined, only two were found to be significant. Specifically, education level was significant ($\beta = 0.09$, $p = 0.002$), indicating that higher levels of education are associated with higher subjective well-being in older adults. This finding is consistent with previous studies in China, which have shown that higher education levels enable individuals to access information and cope with negative emotions effectively, leading to greater life satisfaction^[37-38]. It is noteworthy that labor force participation still has a significant impact on the subjective well-being of older adults even after accounting for demographic characteristics. Compared to model 1, R^2 increased from 0.86 to 0.87, indicates the combined predictors accounted for a significant portion of variance (87%) in the total score. The beta weights suggest that labor participation ($\beta = 0.92$) had a stronger predictive value for life satisfaction compared to education level ($\beta = 0.09$).

4.3.2. Depression (CES-D-10)

The analysis aimed to investigate the impact of labor participation and demographic variables on the depression risk of older adults. Two models were developed using linear regression. Model 3 focused solely on labor participation, while Model 4 also included demographic variables such as gender, age, education level, and monthly income. The findings indicated that neither Model 3 nor Model 4 had significant results, as the significance level for both models was greater than 0.05 (see **Table 5**). This suggests that neither labor participation nor demographic variables had a substantial effect on the depression risk of older adults.

Table 5. Multiple regression analysis of depression ($N=202$).

Predictor	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	$R^2/\Delta R^2$
Model 3						0.00/-0.00
Labor Participation	-0.88	0.99	-0.06	-0.89	0.38	
Model 4						0.03/0.01
Labor Participation	1.05	1.37	0.08	0.77	0.44	
Age	-0.04	0.10	-0.04	-0.45	0.65	
Gender	2.17	1.27	0.15	1.71	0.09	
Education	-2.37	1.40	-0.14	-1.70	0.09	
Monthly Income	0.00	0.00	-0.03	-0.36	0.72	

Note: $p^{***} < 0.001$, $p^{**} < 0.01$.

Regression Method: OLS (Ordinary Least Squares) Regression

5. Discussion

The data from this study show that educational level and labor participation have a significant positive effect on subjective well-being specifically life satisfaction of older adults. This may be because older people with higher levels of education usually have a wider range of knowledge and access to information, and they are better able to adapt to the challenges posed by social and technological change. Research shows that older adults face multiple challenges in using the Internet and digital devices, including physical, cognitive, and social barriers^[39]. This condition makes them less confident in using new technologies. Older adults with higher levels of education, on the other hand, tend to be better learners, more accepting of new things, and more adaptable when using technology. Thus, they can reduce anxiety about uncertainty and increase their sense of control over their lives. In addition, increased labor participation is closely linked to life satisfaction among older adults. Participation in the labor force not only makes older adults feel happier and more satisfied, but also, from the perspective of human capital, brings their knowledge, skills, and experience into full play. Such participation reduces the sense of identity loss and social isolation that older adults may experience after retirement and helps to maintain their mental health and emotional stability. At the same time, labor participation provides important social support, not only materially bringing economic income to meet the economic needs of daily life, but also psychologically providing a sense of accomplishment and satisfaction. Also, this finding was consistent with the activity theory^[40]. Activity theory suggests that an individual's participation in moderately challenging yet manageable activities in old age promotes high levels of subjective well-being and is positively linked to mental health.

Based on the finding above, this current study has several recommendations. Firstly, the government can play a crucial role in encouraging enterprises to provide part-time, temporary, or teleworking opportunities for older adults by implementing flexible employment policies. Financial incentives can also be offered to incentivize businesses to hire older adults. Furthermore, it is essential to enhance the elderly service system, ensuring that older adults receive comprehensive medical care and psychological support to improve their quality of life and overall well-being. Then, at the community level, there is a need to cultivate a social environment that promotes active aging. This can be achieved by organizing a diverse range of community activities, including cultural recreation, physical exercise, and volunteer services, to boost the sense of social participation and belonging among older adults. Additionally, it is essential to provide regular psychological counseling and guidance to help older adults manage psychological stress and prevent and

address issues such as depression. From the perspective of older adults' families and the individuals themselves, it is crucial to encourage family members to provide more support and care for the labor and life of older adults, thus fostering a stronger sense of family well-being. Furthermore, older adults should maintain a positive outlook, actively participating in various social activities and educational pursuits, engaging in vocational skills training, and prioritizing their physical and mental health.

However, several limitations should be acknowledged about this study. Firstly, we utilized the cross-sectional research design, which means that the information gathered at a single point in time cannot be compared and analyzed over a longer period. Secondly, the sample mainly consisted of 202 older adults from the cities of Shijiazhuang, Baoding, and Chengde in Hebei Province, China. Since this sample was specific to these cities and was not large, the findings may not be generalized to reflect the situation of older adults in other regions of China. This means that the study results may have limited applicability to a broader population.

6. Conclusion

This study investigates into the variables impacting the well-being of older adults in urban China within the scope of active aging. The findings from the stepwise multiple regression analysis revealed that the educational level and labor force engagement of older adults significantly contribute to their subjective well-being. For future investigations, developing a comprehensive model encompassing personal and social factors, such as self-regulation and social support, can provide a deeper understanding of older adults' well-being. Additionally, a longitudinal study could offer a more thorough analysis of the complex relationship between influencing factors and subjective well-being, supplying dynamic and comprehensive research outcomes. Utilizing these research findings to shape policy and intervention programs for enhancing the mental well-being of older adults will provide a solid scientific basis for promoting subjective well-being among older populations.

Author contributions

Conceptualization, LI XIA and Noradilah Md Nordin; methodology, LI XIA and Noradilah Md Nordin; software, LI XIA; investigation, LI XIA; data curation, LI XIA and Noradilah Md Nordin; writing—original draft preparation, LI XIA and Noradilah Md Nordin; writing—review and editing, Noradilah Md Nordin. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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