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Impact of lifestyle habits on the health self-assessment of rural older men of different ages: evidence from the Chinese longitudinal healthy longevity survey

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Abstract

This study examined the influence of lifestyle habits on health self-assessments among elderly rural men and the effect of age on the strength of the impact to provide a basis for targeted health improvement in this population. Data from the 2018 Chinese longitudinal healthy longevity survey were analyzed using one-way analysis of variance, regression analysis, and Shapley value decomposition tests. The model analysis results showed that elderly rural men who did not drink alcohol or were moderate drinkers, maintained regular sleep patterns, exercised regularly, and had active social interactions had better health self-assessment results ($p < 0.01$). Notably, the impact of lifestyle habits on health perceptions varied with age. Specifically, the influence of alcohol consumption and sleep duration decreased with age, while the benefits of physical activity and social engagement became more pronounced. These results suggest that lifestyle habits significantly impact the health self-assessments of elderly rural men, with notable variations observed in the strength of these effects across different ages. To improve the overall health of elderly rural men, alcohol cessation interventions should be implemented as early as possible, attention should be paid to the sleep habits of young male seniors, and low-intensity group exercise and social activities should be actively organized for older male seniors.

Keywords

Perceived health; Living habits; Rural male elderly; Age differences

1. Introduction

The China Population & Employment Statistical Yearbook estimated that by the end of 2021, the elderly population aged 60 and over will constitute 15.86% of urban areas and 23.80% of rural areas in China. This demographic data reveals a significant aging trend in rural regions compared to urban counterparts, highlighting a greater prevalence of geriatric health challenges in China's rural areas. Compared to urban areas, elderly men in rural areas not only have a higher demand for care and services but also face a greater lack of healthcare resources [1, 2] and more complex health problems, such as survival difficulties and mental isolation [3]. The prevalence of lifestyle-related chronic diseases is on the rise, making the study of health-related lifestyles increasingly critical. The Healthy China initiative (2019–2030) attributes 60% of health outcomes to personal behavior and lifestyle choices, portraying the significant impact of daily habits on an individual's health. Lifestyle factors such as alcohol consumption, smoking, sleep quality and physical activity are major contributors to chronic diseases and mortality [4–6]. Alcohol, while linked to various chronic conditions and identified as a health risk [7], has been shown in some studies to potentially reduce the risk of coronary

heart disease when consumed in moderation [8]. Smoking is the leading cause of death and has been associated with an increased risk of vascular diseases, cancer and respiratory diseases [9]. Sleep-related studies indicate that an optimal duration of 7 hours may minimize the risk of mortality, with deviations from this duration being linked to higher death rates [10]. Regular physical activity is beneficial for bone health, reducing the risk of falls, injuries, and fractures, thus potentially extending lifespan in men [11]. Moreover, social isolation, resulting from infrequent social interactions, has been closely linked with increased health risks [12]. Therefore, promoting healthy living habits, such as abstaining from smoking, moderating alcohol intake, ensuring adequate sleep, engaging in regular physical activity, and fostering social connections, is important for enhancing both the physical and psychological health of the elderly. The shifting health needs of China's elderly population, from basic survival to more developmental concerns, has led to the "five-year plan on elderly care for the 2021–2025 period", emphasizing the importance of categorizing and tailoring services to meet the diverse needs of different elderly groups. This evolution calls for a refined approach to developing elderly health services. For implementing targeted improvement measures and providing refined health services,

the key factors affecting the health of the elderly population should be identified. Studies on the factors affecting the health of rural elderly persons have mostly focused on intergenerational support [13], intergenerational care [14], social security [15], social assistance [16], and other non-individual factors from the family and society. These studies usually analyze older people as a whole, ignoring living habits, which is an important and controllable individual factor, and the possible age differences in the strength of the influence of the factors, which can help refine the health services for the Chinese rural elderly population. Therefore, our present study was designed to explore how lifestyle habits influence the health of elderly rural men in China and examine the variability of these effects across different age groups to establish a foundation for developing precise health improvement interventions tailored to this demographic.

2. Materials and methods

2.1 Sources of information

Cross-sectional data were obtained from the 2018 Chinese Longitudinal Healthy Longevity Survey (CLHLS), which is a pioneering and extensive gerontological and social science survey project in China managed by the Peking University Center for Healthy Aging and Development. As the earliest and most comprehensive nationwide survey of its kind, CLHLS covers 23 provinces, municipalities and autonomous regions, making it a critical resource for analyzing gerontological health issues. Employing a targeted random sampling approach, the CLHLS focuses primarily on individuals aged 60 years and above. With a database comprising 113,000 household interviews, the scientific rigor and representativeness of the sample selection are well-established [17]. From the 2018 CLHLS dataset, which included 15,874 interviews, we selected data on male adults aged 60 years and above residing in rural areas. After excluding samples with missing key variables or inconsistent responses, 1996 samples were retained for inclusion in our study analysis.

2.2 Research methodology

In this study, the primary outcome variable was the self-assessed health status of elderly rural men, which was measured through the survey question: "How do you feel about your own health now?" serving as a subjective indicator of the participants' overall health perception. To improve the analysis of perceived health outcomes, we utilized a 4-point scale, aligning with previous research that suggests such a scale effectively distinguishes perceptions of health into positive and negative categories [18]. Accordingly, we coded responses of "good" and "very good" collectively as "good", assigning them a value of 4; "fair" received a value of 3; "not good" was coded with a value of 2; and "very bad" was assigned the lowest value of 1.

In this study, the independent variables were composed of five lifestyle habits: smoking status, alcohol consumption, sleep duration, engagement in physical exercise, and frequency of social interactions. Additionally, several control variables were included to account for individual characteristics, namely age, marital status, and education level of the respondents. The classification of smoking habits was based on current smoking status. Participants who confirmed being currently smoking were categorized as engaging in the harmful habit of smoking and were assigned a value of 1; otherwise, they received a value of 0. This categorization is grounded in evidence indicating that both light (fewer than five cigarettes per day) and heavy smokers (five or more cigarettes per day) exhibit a significantly accelerated decline in lung function compared to non-smokers [19]. For alcohol consumption, the CLHLS collected data on average daily intake and the primary type of alcohol consumed. Following methodologies from prior studies [20], we calculated the average daily alcohol consumption for each respondent. Consistent with research suggesting that a daily intake of up to 10 grams of alcohol may be considered safe [21], consumption exceeding this threshold was deemed excessive drinking and assigned a value of 1; all other instances were coded as 0. Sleep duration was categorized based on health recommendations, with 6–8 hours of sleep considered normal (assigned a value of 1) and durations of less than 6 hours or more than 8 hours considered abnormal, receiving a value of 0 [22]. Regular physical activity was identified through the question, "Do you do exercises regularly at present?". Affirmative responses indicated regular physical activity and were assigned a value of 1, while negative responses were coded as 0. Educational attainment was quantified based on the total years of education completed by the respondent, with specific benchmarks (*e.g.*, completion of elementary school) receiving corresponding numerical values. Age groups were delineated according to World Health Organization criteria, dividing the rural elderly men into low-aged (60–74 years), middle-aged (75–89 years), and high-aged ($\geq$90 years) categories [23]. Table 1 presents the assignment of values for each variable and descriptive statistics, offering a comprehensive overview of the variables under study.

2.3 Statistical methods

In this study, we first determined the association between each variable and the self-reported health status of elderly rural men via one-way analysis of variance (ANOVA). Subsequently, multiple regression analysis was performed to test whether the factors were still significant in the presence of multiple other factors and whether there was age heterogeneity in the strength of the effects. Finally, we clarified the changes in the significance of the effect of the factors on health self-assessments of age groups using the decomposition of Shapley value. One-way analysis of variance was performed using the Chi-squared test and Kruskal-Wallis rank sum test depending on the type of independent variable. Regression analysis was performed using multivariate ordered logistic regression since the dependent variable was a multivariate ordered variable. Shapley value decomposition is an important method for calculating the difference in the contribution value of each independent variable to the dependent variable by decomposing the R^2 in the framework of cooperative games, thus distributing the benefits. Furthermore, it is a reliable tool for effectively decomposing the causes of problems in

T A B L E 1. Selection and description of variables.

Variable	N	%	Min	Max	SD
Health self-assessment	1996		1	4	1.65
Very bad	26	1.30			
Not good	238	11.92			
Fair	749	37.53			
Good	983	49.25			
Smoking status	1996		0	1	0.47
Nonsmoking	641	32.11			
Smoking	1355	67.89			
Drinking status	1996		0	1	0.72
No alcohol or moderate alcohol consumption	560	28.06			
Excessive drinking	1436	71.94			
Sleep duration	1996		0	1	0.50
Abnormal (<6 h & >8 h)	884	44.29			
Normal (6–8 h)	1112	55.71			
Physical exercise	1996		0	1	0.69
Physical inactivity	629	31.51			
Physical activity	1367	68.49			
Frequency of friends interaction	1966		0	2	0.91
Never	997	49.95			
Sometimes	312	15.63			
Usually	687	34.42			
Age (yr)	1996		1	3	0.77
60–74	589	29.51			
75–89	811	40.63			
90 and above	596	29.86			
Marital status	1996		0	1	0.49
Not in marriage	810	40.58			
Married	1186	59.42			
Educational attainment	1996	-	0	22	3.56

The mean value of educational attainment was 3.79. SD: Standard deviation.

social sciences [24] and can be used to demonstrate the specific variations in the strength of the influence of lifestyle habits on the health self-assessments of rural men in old age in different age groups. Data processing and analysis were performed using Stata 16.0 (StataCorp LLC, Texas, USA). A p value $<$ 0.1 was considered statistically significant.

3. Results

3.1 Basic information of the respondents

Among the 1996 elderly rural men included in this analysis, 1732 (86.8%) reported positive health self-assessments, while 264 (13.2%) reported negative health self-assessments. The mean age of participants was 82.15 ± 10.80 years. The age distribution was relatively even across the designated age groups, with 589 (29.5%) respondents aged 60–74 years, 811 (40.6%) aged 75–89 years, and 596 (29.9%) aged 90 years or older. In terms of marital status, 1186 (59.4%) of the respondents were married, and 810 (40.6%) were unmarried. The average educational attainment among the participants was 3.79 years, reflecting a generally low level of literacy in the sample.

3.2 One-way analysis of the impact of lifestyle habits on the health self-assessments of rural men in old age

The results of the one-way analysis showed that except marital status, all other lifestyle habits, including smoking status, drinking status, sleep duration, physical exercise, frequency of friend interaction, age and educational attainment, were all significantly associated with the self-assessed health status of rural elderly men ($p < 0.1$) (Table 2).

TABLE 2. One-way analysis of self-assessed health status of elderly rural men (%).

Variable	Positive health self-assessment (n = 1732)	Negative health self-assessment (n = 264)	χ^2/H
Smoking status			
Nonsmoking	564	77	7.10*
Smoking	1168	187	
Drinking status			
No alcohol or moderate alcohol consumption	510	50	34.81***
Excessive drinking	1222	214	
Sleep duration			
Abnormal (<6 h & >8 h)	743	141	17.26***
Normal (6–8 h)	989	123	
Physical exercise			
Physical inactivity	557	72	23.54***
Physical activity	1175	192	
Frequency of friends interaction			
Never	884	113	
Sometimes	269	43	26.31***
Usually	579	108	
Age (yr)			
60–74	516	73	
75–89	703	108	8.70*
≥90	513	83	
Marital status			
Not in marriage	701	109	3.01
Married	1031	155	
Educational Attainment	-	-	13.87***

*$p < 0.1$, ***$p < 0.01$.*

3.3 Regression analysis of the impact of lifestyle habits on the health self-assessments of rural men in old age and age group differences

To examine the impact of lifestyle habits on the self-reported health status of rural elderly men across different age cohorts and to assess the presence of heterogeneity when all factors are considered together, this research employed a multivariate logistic regression model for multifactorial analysis, with health self-assessment as the outcome variable. Given that marital status did not exhibit a significant relationship with health self-assessment in the preliminary analysis, it was excluded from the regression model. The results of the regression analysis indicated that maintaining normal sleep duration ($\beta = 0.305$, $p < 0.01$), engaging in regular physical exercise ($\beta = 0.318$, $p < 0.01$), and frequent interaction with friends ($\beta = 0.162$, $p < 0.01$) acted as protective factors for the health of elderly rural men. Conversely, excessive drinking ($\beta = -0.550$, $p < 0.01$) was identified as a detrimental factor to their health. Furthermore, the analysis revealed considerable variation in the impact of these factors on the health of rural elderly men across different age groups (Table 3).

3.4 Shapley value decomposition of the effect of lifestyle habits on the health self-assessments of elderly rural men in different age groups

While regression analysis reveals the direction and strength of the impact that independent variables have on health assessments, it does not fully explain how the importance of each factor changes across different age groups. To overcome this limitation, we applied the Shapley value decomposition method, which allowed us to include factors that showed significant effects in the regression analysis and assess their varying impacts on the health perceptions of elderly rural men across low, middle and high age categories. The results indicated that the impact of lifestyle habits on perceived health status differed significantly by age group: drinking status influenced the low age group by 53.27%, the middle age group by 35.40%, and the high age group by 10.63%; sleep duration affected them by 41.17%, 8.93% and 7.68%, respectively; physical exercise by 3.03%, 24.77% and 57.03%, respectively; and social interactions with friends by 2.52%, 30.90% and 24.66%, respectively, as shown in Table 4.

T A B L E 3. Regression analysis of self-reported health status of elderly rural men.

Variable (Reference group)	All ages		Low-age (60–74 years)		Middle-age (75–89 years)		High-age (≥90 years)	
	Coef.	S.E. (95% CI)	Coef.	S.E. (95% CI)	Coef.	S.E. (95% CI)	Coef.	S.E. (95% CI)
Smoking status (Nonsmoking)	−0.023	0.097 (−0.2130, 0.1665)	−0.307*	0.168 (−0.6372, 0.0224)	−0.074	0.153 (−0.3736, 0.2265)	0.375*	0.194 (−0.0040, 0.7546)
Drinking status (No alcohol or moderate alcohol consumption)	−0.550***	0.104 (−0.7528, −0.3464)	−0.825***	0.180 (−1.1773, −0.4731)	−0.588***	0.170 (−0.9219, −0.2548)	−0.128	0.196 (−0.5123, 0.2558)
Sleep duration (Abnormal)	0.305***	0.088 (−0.4781, −0.1312)	0.629***	0.170 (−0.9620, −0.2958)	0.243*	139 (−0.5149, 0.0281)	0.156	0.159 (−0.4667, 0.1553)
Physical exercise (Physical inactivity)	0.318***	0.097 (0.1282, 0.5084)	0.170	0.173 (−0.1689, 0.5092)	0.393***	0.150 (0.0990, 0.6858)	0.375*	0.194 (−0.0052, 0.7546)
Frequency of interacting with friends (Never)	0.162***	0.049 (0.0670, 0.2584)	0.093	0.098 (−0.0997, 0.2862)	0.234***	0.076 (0.0840, 0.3819)	0.115	0.089 (−0.0594, 0.2894)
Educational attainment	−0.025	0.013 (−0.0510, 0.0006)	0.016	0.024 (−0.0643, 0.0317)	0.009	0.020 (−0.0495, 0.0304)	−0.051	0.025 (−0.1008, −0.0012)
Age (60–74 years)	0.037	0.062 (−0.1586, 0.0842)						
N	1996		589		811		596	
R^2	0.0204		0.0336		0.0242		0.0162	

*$p < 0.1$, ***$p < 0.01$. CI: Confidence interval, S.E.: Standard error.

T A B L E 4. Shapley value of the effect of life habits on the self-assessed health of rural elderly men in different age groups.

Variable	Low-age (60–74 years)		Middle-age (75–89 years)		High-age (≥90 years)	
	Contribution to R^2 (%)	Rank	Contribution to R^2 (%)	Rank	Contribution to R^2 (%)	Rank
Drinking status	53.27	1	35.40	1	10.63	3
Sleep duration	41.17	2	8.93	4	7.68	4
Physical exercise	3.03	3	24.77	3	57.03	1
Frequency of interaction with friends	2.52	4	30.90	2	24.66	2
Total	100	-	100	-	100	-

4. Discussion

4.1 Lifestyle habits have a significant impact on the health self-assessments of rural elderly men

The impacts examined in this study are focused on perceived health, as the data collected is based on self-reports, making it inherently subjective. This methodology does not juxtapose the respondents' self-assessments with any standardized objective health metrics. However, despite the potential variances between self-reported health status and clinically assessed health status, perceived health remains a crucial indicator of an individual's health condition [25, 26]. Gerontological research substantiates that the self-assessment of health by older adults can reliably predict their actual health status, with markedly negative self-perceptions of health being associated with an increased risk of premature death [27].

The present study identified a notable influence of lifestyle

habits on the self-perceived health status of rural elderly men, aligning with the findings of Ye Jinzhen [5]. It has been established that smoking and excessive alcohol consumption are significant risk factors for deteriorating health in senior years [28, 29]. However, our regression analysis indicated that smoking did not significantly impact the health self-assessments among this demographic, possibly due to the confounding effects of other variables. Additionally, it was observed that a considerable proportion of older men engage in excessive alcohol consumption [30, 31], underscoring the need for targeted interventions in this population group. Excessive alcohol consumption among rural elderly men is linked to poorer self-assessments of health, a relationship potentially rooted in the association between heavy drinking and the onset of common mental disorders, immediate alcohol-related adverse effects, and dependency on alcohol [32]. These negative outcomes of excessive alcohol use are likely to impair older adults' perception of their health. Furthermore, the duration of night-time sleep serves as an indicator of the rest quality obtained by the elderly. Insufficient sleep can result in daytime lethargy, while oversleeping may cause prolonged oxygen deprivation and neuronal inhibition in the brain, leading to feelings of fatigue and emptiness. Thus, sleep irregularities can diminish immunity in the elderly, increasing vulnerability to various health conditions [33]. Our findings also highlight that rural elderly men engaging in regular physical activity reported better perceived health, aligning with the research of Yang Fan *et al.* [34]. Additionally, engaging in deliberate physical exercise not only enhances physical well-being but also alleviates psychological stress. The frequency of interactions with friends positively correlates with the self-reported health status among rural elderly men. Active social engagement not only wards off the decline in motor functions but also significantly enhances both physical and mental health, bringing about mental contentment [35]. To capitalize on these insights, township government departments should collaborate with community organizations to highlight the significance of lifestyle habits for elderly health. This collaboration could involve inviting experts to deliver comprehensive lectures on fostering positive lifestyle habits in rural areas and offering programs and services designed to meet the specific needs of rural elderly men, aligning with supportive public policies. Establishing village gymnasiums for the organization of low-intensity physical activities, such as jogging and tai chi, by village officials, as well as cultural rooms for engaging in cultural and recreational activities like calligraphy, chess, singing and dancing, could provide the elderly with the means to translate knowledge into action. This initiative aims to facilitate a shift in mindset and behavior among the elderly population [36]. Additionally, rural family members are encouraged to pay closer attention to the elderly, reinforcing their advice and encouragement to foster healthy living habits. For their part, rural elderly men should strive to limit alcohol consumption, maintain regular sleep patterns, engage in active exercise, and continue socializing to improve their health.

4.2 Effects of alcohol consumption and sleep hours on the health self-assessments of rural men in old age diminish with age

Excessive drinking significantly affects younger male seniors more than older ones, potentially due to alcohol's effect on nerve function, leading to motor and cognitive impairments in older adults [37]. Younger seniors, who are more active in daily behaviors such as working and socializing, may more acutely feel the detrimental effects of alcohol. In contrast, middle-aged and older seniors who engage less in physical activities might not perceive the negative impacts of excessive alcohol use as strongly. Nonetheless, the reduced influence of excessive alcohol consumption on the self-rated health of older seniors does not diminish the actual health risks associated with heavy drinking, especially considering the natural decline in physical health that accompanies aging. The influence of sleep duration on perceived health diminishes with age, likely because younger rural elderly men are more engaged in physical labor [38]. Their higher level of physical activity demands quality rest to recover from the energy expended, making adequate sleep crucial for their perceived health improvement. In contrast, for middle-aged and older seniors, whose physical activity is less, the necessity for extensive rest decreases [39]. Consequently, the significance of sleep for their perceived health perception diminishes. It is important to convey the benefits of healthy behaviors to this demographic through engaging methods, such as memorable slogans like "Don't touch alcohol, be healthy" and "Sleep well, be healthy together", and through educational content like films and expert lectures. Township government departments could implement measures to limit unnecessary "drinking parties" in villages to prevent younger seniors from developing drinking habits in group settings that are hard to break later in life. Moreover, creating village regulations, with input from residents, to define acceptable hours for night-time activities can help manage disturbances. Proactively addressing activities that fall outside these hours is essential for minimizing rural noise pollution, thereby preserving a conducive sleep environment for the elderly and enhancing their sleep quality. Additionally, families in rural communities should play a supportive role in moderating the drinking habits and sleep patterns of the elderly, who in turn should be encouraged to actively participate in these health-promoting practices.

4.3 The impact of physical activity and friends' interaction on the health self-assessments of elderly rural men strengthens with age

Compared with their younger counterparts, senior male elderly exhibit a significant decline in self-care and socialization abilities. This decline contributes to increased feelings of loneliness, worthlessness, and other negative emotions [40], which, if unresolved, adversely affect their perceived health. However, the potential for enhancing the quality of life through physical exercise remains significant, and the ability to maintain social connections does not necessarily decrease with diminished physical function [41]. Aging individuals often rely on physical activity and social interaction as primary

methods for alleviating stress and improving well-being. Participation in group exercise further facilitates extended periods of communication among participants, effectively reducing physical strain and alleviating psychological stress through social support [42]. Thus, it is advisable to promote suitable physical activities for rural elderly men, particularly those of middle and advanced age. Organizing regular, low-intensity group exercises and social activities could substantially benefit their physical and emotional health. Specifically, rural communities can increase older men's engagement in activities by introducing incentive mechanisms like "punch cards" and "invitations". Through these systems, older men can accrue points by attending group activities or by inviting fellow peers, with additional rewards for including the eldest among them. These points can then be redeemed for practical items like eggs, grains, oil and seeds. It is important for family members to collaborate with the community, clarifying how these activities work and their benefits and motivating elderly men to join. They should also offer guidance on the appropriate level of physical activity and its duration. In turn, elderly men are encouraged to embrace the support from their communities and families, actively engaging in and exploring new activities.

Our study has some limitations. The present study faces several limitations. Firstly, the evaluation of participants' health status was based solely on self-reported questionnaires, lacking clinical corroboration. Secondly, constrained by the questionnaire's design, our analysis was limited to assessing the impact of current smoking and excessive alcohol intake on self-reported health. The comprehensive aspects of these behaviors, such as frequency and type of consumption, and their specific effects on the health of rural male elderly, remain to be elucidated in future research endeavors. Thirdly, the employment of cross-sectional data precludes the derivation of causal inferences. The observed differences across age cohorts might not only reflect the intrinsic attributes of these groups but could also be indicative of cohort effects, arising from societal evolution and changing lifestyle patterns across generations. Consequently, the generalizability of our findings is limited, necessitating further longitudinal studies to confirm the long-term health consequences associated with detailed lifestyle habits.

5. Conclusions

This study revealed that rural elderly males who abstained from alcohol or consumed it moderately, maintained a sleep duration of 6–8 hours, participated in regular physical activities, and frequently socialized with friends reported better self-assessed health outcomes. The impact of these factors on health perceptions varied among different age groups. Specifically, the significance of alcohol consumption and sleep duration declined with age, whereas the benefits of physical activity and social interaction increased. This underscores the necessity of adopting a differentiated approach to support and assist rural males across various age cohorts. Future interventions aimed at enhancing the health status of this demographic should be tailored to their unique characteristics and needs, thereby fostering the well-being of elderly rural males in China.

REFERENCES

[1] Zhang L, Zeng Y, Wang L, Fang Y. Urban-rural differences in long-term care service status and needs among home-based elderly people in China. International Journal of Environmental Research and Public Health. 2020; 17: 1701.

[2] Goins RT, Kategile U, Dudley KC. Telemedicine, rural elderly, and policy issues. Journal of Aging & Social Policy. 2002; 13: 53–71.

[3] Ran XX, Hu HW. Urban-rural disparity, digital divide and health inequality of the elderly. Population Journal. 2022; 44: 46–58.

[4] Sun MF, Ni WQ, Yuan XL, Chi HS, Sun YY, Xu J. Evaluation of the effect of smoking, drinking and exercise behavioral interventions for people at high risk of chronic diseases in Fujian District, Shenzhen, China. Chinese Journal of Prevention and Control of Chronic Diseases. 2020; 28: 358–362. (In Chinese)

[5] Ye JZ. Relationship between retirement, living habit and health: based on harmonized CHARLS data. Population & Economics. 2018; 227: 80–90.

[6] Chen L, Yuan BK, Li WY. Mediating and moderating effects of perception of stress between health concern and living habits. Journal of Nursing. 2022; 29: 1–4.

[7] GBD 2016 Alcohol Collaborators. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 2018; 392: 1015–1035.

[8] Rimm EB, Williams P, Fosher K, Criqui M, Stampfer MJ. Moderate alcohol intake and lower risk of coronary heart disease: meta-analysis of effects on lipids and haemostatic factors. The BMJ. 1999; 319: 1523–1528.

[9] Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. The BMJ. 2004; 328: 1519.

[10] Kripke DF, Garfinkel L, Wingard DL, Klauber MR, Marler MR. Mortality associated with sleep duration and insomnia. Archives of General Psychiatry. 2002; 59: 131–136.

[11] American College of Sports Medicine. American college of sports medicine position stand. Exercise and physical activity for older adults. Medicine and Science in Sports and Exercise. 1998; 30: 992–1008.

[12] Ng CWL, Luo N, Heng BH. Health status profiles in community-dwelling elderly using self-reported health indicators: a latent class analysis. Quality of Life Research. 2014; 23: 2889–2898.

[13] Li Y, Guo M. Filial piety matters: a study of intergenerational supports and parental health. Ssm-Population Health. 2022; 18: 101096.

[14] Zhang YL, Liu JK. The effect of intergenerational care on elderly's physical and mental health and its mechanism analysis: an empirical analysis based on 2014 data from the China longitudinal aging social survey. Journal of Agrotechnical Economics. 2022; 324: 117–131.

[15] Zhang YY, Chen D. Does new rural social pension alleviate the inequality of opportunity between urban and rural elderly health: evidence from the CHARLS data. Journal of Agrotechnical Economics. 2023; 82–99.

[16] Sun JL. Influence of social support factors on the health of elderly floating population in China. Medicine and Society. 2022; 35: 26–30.

[17] Zeng Y. Towards deeper research and better policy for healthy aging—using the unique data of Chinese longitudinal healthy longevity survey. China Economic Journal. 2012; 5: 131–149.

[18] Park KM, Ha EK. Ability of self care and health promotion lifestyle for vulnerable elderly in urban community. Korean Public Health Research. 2004; 30: 96–103.

[19] Oelsner EC, Balte PP, Bhatt SP, Cassano PA, Couper D, Folsom AR, et al. Lung function decline in former smokers and low-intensity current smokers: a secondary data analysis of the NHLBI pooled cohorts study. The Lancet Respiratory Medicine. 2020; 8: 34–44.

[20] Li J, Wu B, Tevik K, Krokstad S, Helvik A. Factors associated with elevated consumption of alcohol in older adults—comparison between China and Norway: the CLHLS and the HUNT study. BMJ Open. 2019; 9: e028646.

[21] GBD 2020 Alcohol Collaborators. Population-level risks of alcohol consumption by amount, geography, age, sex, and year: a systematic analysis for the Global Burden of Disease Study 2020. The Lancet. 2022; 400: 185–235.

[22] Wu M, Wang YP, Wang WH, Sa RN, Hu ZP, Liu R, et al. Relationship between sleeping duration and metabolic syndrome in adults of Shaanxi Province. Chinese Journal of Prevention and Control of Chronic Diseases. 2022; 30: 920–923. (In Chinese)

[23] Hua QZ. Gerontological nursing. 3rd edn. People's Medical Publishing House: Beijing. 2012.

[24] Liu ZY, Chen X, Gill TM, Ma C, Crimmins EM, Levine ME. Associations of genetics, behaviors, and life course circumstances with a novel aging and healthspan measure: evidence from the health and retirement study.

PLOS Medicine. 2019; 16: 1002827.

[25] Knapik A, Brzęk A, Famuła-Wąż A, Gallert-Kopyto W, Szydłak D, Marcisz C, et al. The relationship between physical fitness and health self-assessment in elderly. Medicine. 2019; 98: e15984.

[26] Lee HJ, Dugan E. How large is the gap between self-report and assessed mental health and does it impact older adult mental health service utilization? Journal of Gerontological Social Work. 2015; 58: 3–19.

[27] Franek G, Cabaj M, Nowak Z. The self-assessment of health condition among elderly people. Wiadomosci Lekarskie. 2002; 1: 668–672.

[28] Si M S. Study on correlation between self-rated health status and life style of the oldest-old in integrated medical treatment and care institutions in Qingdao. Medicine and Society. 2018; 227: 80–90.

[29] Gao M Y, Huang W, Yang S. A study of mental health self-assessment and lifestyle-related factors among the elderly in Liaoning province. Chinese Journal of Health Statistics. 2022; 29: 1–4.

[30] Gilson K, Bryant C, Judd F. Exploring risky drinking and knowledge of safe drinking guidelines in older adults. Substance Use & Misuse. 2014; 49: 1473–1479.

[31] Qiu Y J, Lv X Z, Wu T F, Zhang Y, Wang H, Li B, et al. Prevalence and correlates of risky drinking among the oldest-old in China: a national community-based survey. Frontiers in Psychiatry. 2022; 13: 919888.

[32] Pillai A, Nayak MB, Greenfield TK, Bond JC, Nadkarni A, Patel V. Patterns of alcohol use, their correlates, and impact in male drinkers: a population-based survey from Goa, India. Social Psychiatry and Psychiatric Epidemiology. 2013; 48: 275–282.

[33] Liao H, Liao S, Gao Y, Mu J, Wang X, Chen D. Correlation between sleep time, sleep quality, and emotional and cognitive function in the elderly. BioMed Research International. 2022; 2022: 9709536.

[34] Yang F, Huang YJ, Wang FBH. Physical exercises of Chinese older adults and social participation: health promotion and network expansion. Population Research. 2021; 45: 97–113.

[35] Yang X, Wang Y L. Quantitative analysis: influence of social activities on the elderly health. Population Journal. 2020; 42: 66–77.

[36] Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. Journal of Consulting and Clinical Psychology. 1983; 51: 390–395.

[37] Ray A, Ninave S, Patil PS, Ninave S, Khan T. Assessing the behavioral and personality changes in alcohol dependence syndrome in Wardha, Central India. Cureus. 2023; 15: e48419.

[38] Ci Q Y, Cheng Y R. The influence of family factors on the elderly's labor participation in Rural areas. New horizons from Tianfu. 2022; 228: 74–86.

[39] Lan T, Lan T, Wen C, Lin Y, Chuang Y. Nighttime sleep, Chinese afternoon nap, and mortality in the elderly. Sleep. 2007; 30: 1105–1110.

[40] Wu Z, Sun L, Sun Y, Zhang X, Tao F, Cui G. Correlation between loneliness and social relationship among empty nest elderly in Anhui rural area, China. Aging & Mental Health. 2010; 14: 108–112.

[41] Ding Z H. The influence of social participation of the rural oldest-old on their health. Lanzhou Academic Journal. 2018; 303: 179–195. (In Chinese)

[42] Li W J. The effect of physical exercise on anxiety and depression among rural left-behind older adults. Chinese Journal of Gerontology. 2015; 35: 7204–7206. (In Chinese)