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Original Article

Influencing Factors of Self-Perceived Health of Older People in a Rural Area in Southern China

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SUMMARY

Background and objective: Self-perceived health (SPH) is a strong indicator of the health and life expectancy of a population. This study aimed to explore the status and influencing factors of SPH in a rural area in Southern China.
Methods: This research was a cross-sectional study involving 1617 participants over the age of 60 years. Standardised questions during face-to-face interviews were provided to collect general information and SPH status. Logistic regression analysis was performed to analyse the SPH status.
Results: Nearly 82% of our study's respondents reported their health status as 'good'. Results showed that annual household income < 3000 yuan (OR = 1.98, 95% CI: 1.23–3.19, p = 0.005), annual household income between 3000 and 5000 yuan (OR = 1.39, 95% CI: 1.03–1.88, p = 0.031), insomnia (OR = 1.86, 95% CI: 1.40–2.47, p < 0.001), drinking (OR = 0.54, 95% CI: 0.38–0.76, p < 0.001), total number of hospitalisations ≥ 2 (OR = 2.82, 95% CI: 1.88–4.24, p < 0.001), total number of hospitalisations = 1 (OR = 2.23, 95% CI: 1.58–3.14, p < 0.001), hearing (OR = 0.47, 95% CI: 0.35–0.64, p < 0.001), vision (OR = 0.65, 95% CI: 0.47–0.88, p = 0.006), doing farm work (OR = 0.62, 95% CI: 0.46–0.82, p < 0.001), chronic diseases (OR = 2.28, 95% CI: 1.60–3.25, p < 0.001) and instrumental activities of daily living independently (OR = 2.21, 95% CI: 1.61–3.03, p < 0.001) were significantly associated with SPH.
Conclusions: This study is the first that examines the determinants of SPH amongst Guilin's older people. The main determinants of SPH amongst older people include economic condition, health status and healthy behaviour.

1.Introduction

Self-perceived health (SPH) could be defined as a global health evaluation performed by subjective self-judgement. SPH was obtained using the simple question 'In general, how do you rate your health?' on a four- or five-point scale.[1] Even though this question is simple and direct, it is one of the best predictors of morbidity,[2] mortality[3] and quality of life.[4] It is also a risk factor for prescribed drug use and future health and social service use in older people.[5] SPH is a measurement widely used in numerous studies because it is closely associated with objective health status and healthcare demand.[6] Furthermore, the World Health Organization recommends SPH as a strong indicator of health and life expectancy of a population.[7]

Health is primordial to guarantee independence, autonomy and continuity in the contribution of older people to society. Particularly, health issues become considerably evident as the aging process progresses. Therefore, self-perception of health becomes mostly negative, interfering in the wellness levels reported by older people.[8,9] The aging process implies increased probability of suffering from diseases and disabilities, particularly in the extremely old population. SPH in older adults has been shown to be associated with socioeconomic factors (e.g. age, sex, income, educational level and familial status), disease status (e.g. comorbidity and polypharmacy) and mental status (e.g. depression and anxiety).[6,10–12]

However, compared with older people in cities, those in rural areas have low schooling and income, more frequent risk factors (e.g. hypertension and diabetes mellitus), poor access to health services and less resources for health care.[13,14] A huge gap exists in the state of health of the population between urban and rural areas.[15,16] Thus, SPH would be important for older people to detect their health conditions early. In this study, older people in rural Southern China were chosen as study population. This study contributes in clarifying the influencing factors of SPH in older people and provides reference for relevant health policies in rural areas.

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2. Materials and methods

2.1. Population and data collection

All subjects were from a healthy population cohort in Gongcheng, Guangxi. Cluster sampling was conducted in two rural areas in Gongcheng between December 2018 and November 2019. Invitation letters (with study information leaflets) were delivered door-to-door by local community leaders or health workers, following extensive publicity campaigns. As a prerequisite for participation, all participants were asked to bring their unique national identity cards to the assessment centre set up in the local community. The study was completed by trained members and data on the subjects were collected with baseline and activities of daily living (ADL) questionnaires. Before the formal survey, we conducted a pre-survey of 100 samples, after which several experts analysed the preliminary results and refined the questionnaire. The cross-sectional sampling survey sample size calculation formula is as follows:

$$N = (Z^2_{\alpha} \times pq) / d^2$$

where N is the sample size, Z is the statistical quantity, $\alpha = 0.05$, $Z = 1.96$, p is the expected prevalence, $q = 1 - p$, d is the allowable error, and $d = 0.1\ p$. The pre-survey results show that the probability of poor SPH is about 20%. The estimated sample size for this study was 1610, to which 5% of the sample were added.

Participants were eligible only if they were (a) a local residents, (b) 60 years or older and (c) able to complete an interview. After incomplete data were excluded, the final sample consisted of 1617 elders. Additionally, we repeated the same questionnaire to some participants within one month after they completed the questionnaire. The results showed good repetition rate and the p-value of the correlation analysis was above 0.05. This study was approved by the Medical Ethics Committee of Guilin Medical University (No. 2018 0702-3). Sample collection and questionnaire survey were conducted on participants who provided written informed consent.

2.2. Assessment of SPH

SPH was assessed though direct interview with the following question: 'In general, how do you rate your health?' The elders could rate their SPH amongst four possible answers: very good, good, reasonable and bad. SPH was dichotomised into good (very good or good) or bad (reasonable or bad).

2.3. Assessment of ADL and instrumental activities of daily living

The ability to perform instrumental activities of daily living (IADL) and ADL was assessed using Lawton and Brody's IADL Scale.[17] The scale has good applicability in rural areas,[18] and the Cronbach's redundancy coefficient is 0.811. The six factors of ADL are eating, toileting, clothing, grooming, walking and bathing; and the eight factors of IADL are cooking, shopping, making phone calls, doing housework, washing clothes, using vehicles, taking medicine and handling money and goods. Each item was graded between 1 (normal) and 4 (disabled). The more scores respondents obtained in ADL and IADL assessment, the higher the functional dependence they would have and need more external care/support from family members or nursing staff.[19] An IADL score of 8 and an ADL score of 6 were considered independent. Otherwise, they were considered dependent.

2.4. Covariate definition

A standardised and structured questionnaire was used to obtain information, particularly age (60–69, 70–79 and ≥ 80 years old), ethnicity (Yao, Han or other ethnic groups) educational level (< 1, 1–6 and ≥ 6 years), the number of hospitalisations (0, 1, ≥ 2 times), participation in group activities (regular, occasional and never), smoking history (yes or no) and alcohol consumption (yes or no). Smoking was defined as currently smoking at least one cigarette per day. Alcohol consumption was defined as drinking at least 50 g of alcohol or more than once a month. Chronic diseases refer to those diagnosed by professional doctors, including hypertension, diabetes, cerebrovascular disease, chronic obstructive pulmonary disease, rheumatism, osteoarthritis, osteoporosis and cancer. The total number of hospitalisations indicates the total number of times elders were hospitalised thus far in their lives.

2.5. Statistical analysis

Chi-square test was used to compare the sociodemographic, health status and related behaviour. Logistic regression analyses were performed, with SPH as the dependent variable, to identify the predictors of SPH. Variables associated with SPH in the Chi-square test analyses were included as explanatory variables. All statistical analyses were performed on SPSS version 26.0. The results were considered statistically significant if the p-value was < 0.05.

3. Result

3.1. Baseline characteristics of the study subjects

The final sample was composed of 1617 elders, mostly female (58.1%), with 1109 (68.6%) individuals between 60 and 69 years and only 72 (4.4%) were over 80 years old. In terms of race, the majority were Yao (67.1%) and Han (28.1%). Only 413 (25.5%) had spouses. Furthermore, 919 (56.8%) individuals received under 1 year of education, 337 (20.8%) were educated between 1 and 6 years and 361 (22.3%) received over 6 years of education. A total of 964 (59.6%) individuals had an annual income of over 5000 yuan, 125 (7.7%) had an annual income between 3000 and 5000 yuan and 528 (32.7%) had an annual income of under 3000 yuan. In terms of social support, only 78 (4.8%) said they had sufficient social support (Table 1).

3.2. Univariate analysis of SPH

Amongst the 1617 participants, 1326 (82.0%) and 291 (18.0%) perceived their health as good and poor, respectively. Table 2 presents the distribution of all independent variables across the SPH categories. Elders with low income ($p < 0.001$), showed a history of hospitalisation ($p < 0.001$), chronic diseases ($p < 0.001$), low level of education ($p = 0.011$) and tendency to refer to their SPH as bad ($p = 0.08$). However, good SPH was reported by those who were male ($p = 0.009$), who do farm work ($p < 0.001$), with normal vision ($p < 0.001$), with normal hearing ($p < 0.001$), who smoke ($p = 0.002$), who drink ($p < 0.001$), were active in group activities and functionally able to perform IADL independently ($p < 0.001$) and without insomnia ($p < 0.01$, Table 2).

3.3. Multivariate analysis of SPH

Logistic regression analyses were performed, with SPH as dependent variable, and education, annual household income, partici-

Table 1
Baseline characteristics of 1617 participants.

	Total (n, %)	Good SPH (n, %)	Bad SPH (n, %)	χ^2	*p*
Sex				6.774	0.009
Male	677 (41.9)	575 (43.4)	102 (35.1)		
Female	940 (58.1)	751 (56.6)	189 (64.9)		
Age (years)				0.141	0.932
60–69	1109 (68.6)	912 (68.8)	197 (67.7)		
70–79	436 (27.0)	355 (26.8)	81 (27.8)		
≥ 80	72 (4.4)	59 (4.4)	13 (4.5)		
Education (year)				8.950	0.011
< 1	919 (56.8)	734 (55.3)	185 (63.6)		
1–6	337 (20.8)	278 (21.0)	59 (20.3)		
≥ 6	361 (22.3)	314 (23.7)	47 (16.1)		
Ethnicity				1.908	0.385
Yao	1085 (67.1)	882 (66.5)	203 (69.8)		
Han	455 (28.1)	377 (28.4)	78 (26.8)		
Other	77 (4.8)	67 (5.1)	10 (3.4)		
With spouse				0.482	0.488
Yes	413 (25.5)	334 (25.2)	79 (27.1)		
No	1204 (74.5)	992 (74.8)	212 (72.9)		
Income (RMB/year)					
< 3000	528 (32.7)	407 (30.7)	121 (41.6)	25.713	< 0.001
3000–5000	125 (7.7)	91 (6.9)	34 (11.7)		
> 5000	964 (59.6)	828 (62.4)	136 (46.7)		
Participation in groups				9.52	0.009
Never	795 (49.2)	630 (47.5)	165 (56.7)		
Occasional	355 (22.0)	294 (22.2)	61 (21.0)		
Regular	467 (28.9)	402 (30.3)	65 (22.3)		
Social support				3.245	0.072
Adequate	78 (4.8)	58 (4.4)	20 (6.9)		
Inadequate	1539 (95.2)	1268 (95.6)	271 (93.1)		
Insomnia				33.034	< 0.001
Yes	727 (45.0)	552 (41.6)	175 (60.1)		
No	890 (55.0)	774 (58.4)	116 (39.9)		
Smoking				9.331	0.002
Yes	315 (19.5)	277 (20.9)	38 (13.1)		
No	1302 (80.5)	1049 (79.1)	253 (86.9)		
Drinking				35.128	< 0.001
Yes	571 (35.3)	512 (38.6)	59 (20.3)		
No	1046 (64.7)	814 (61.4)	232 (79.2)		
Total number of hospitalisations				57.454	< 0.001
1	716 (44.3)	564 (42.5)	152 (52.2)		
≥ 2	268 (16.6)	190 (14.3)	78 (26.8)		
0	633 (39.1)	572 (43.1)	61 (21.0)		
Doing farm work				19.722	< 0.001
Yes	868 (53.7)	746 (56.3)	122 (41.9)		
No	749 (46.3)	580 (43.7)	169 (58.1)		
IADL				45.089	< 0.001
Independent	429 (26.5)	306 (23.1)	123 (42.3)		
Dependent	1188 (73.5)	1020 (76.9)	168 (57.7)		
ADL				1.123	0.289
Independent	46 (2.8)	35 (2.6)	11 (3.8)		
Dependent	1571 (97.2)	1291 (97.4)	280 (96.2)		
Vision				46.947	< 0.001
Normal	1220 (75.4)	1046 (78.9)	174 (59.8)		
Impaired	397 (24.6)	280 (21.1)	117 (40.2)		
Hearing				51.384	< 0.001
Normal	1225 (75.8)	1052 (79.3)	173 (59.5)		
Impaired	392 (24.2)	274 (20.7)	118 (40.5)		
Chronic diseases				53.118	< 0.001
With	941 (58.2)	809 (61.0)	243 (83.5)		
Without	676 (41.8)	517 (39.0)	48 (16.5)		

ADL: activities of daily living; IADL: instrumental activities of daily living; RMB: Ren Min Bi; SPH: self-perceived health.

pation in groups, insomnia, smoking, drinking, total of number of hospitalisations, doing farm work, vision, hearing, chronic diseases and functional ability to perform IADL as explanatory variables. Upon adjusting for sex and age, the results showed that annual household income < 3000 yuan (OR = 1.98, 95% CI: 1.23–3.19, p = 0.005), annual household income between 3000 and 5000 yuan (OR = 1.39, 95% CI: 1.03–1.88, p = 0.031), insomnia (OR = 1.86, 95% CI: 1.40–2.47, p < 0.001), drinking (OR = 0.54, 95% CI: 0.38–0.76, p < 0.001), total number of hospitalisations ≥ two (OR = 2.82, 95% CI: 1.88–4.24, p < 0.001), total number of hospitalisations = one (OR = 2.23, 95% CI: 1.58–3.14, p < 0.001), hearing (OR = 0.47, 95% CI: 0.35–0.64, p <0.001), vision (OR = 0.65, 95% CI: 0.47–0.88, p = 0.006), doing farm work (OR = 0.62, 95% CI: 0.46–0.82, p < 0.001), chronic diseases (OR = 2.28, 95% CI: 1.60–3.25, p <0.001) and IADL independently (OR = 2.21, 95% CI: 1.61–3.03, p < 0.001) were significantly associated with SPH (Figure 1).

Table 2
Logistic regression of factors influencing SPH.

	Mode 1		Mode 2*	
Variables	OR (95% CI for OR)	p	OR (95% CI for OR)	p
Scholarship				
> 6	1.00			1.000
< 1	0.94 (0.59–1.48)	0.779	1.08 (0.67–1.72)	0.760
1–6	0.10 (0.67–1.48)	0.982	1.14 (0.76–1.72)	0.532
Annual household income				
> 5000	1.00		1	
< 3000	1.98 (1.23–3.18)	0.005	1.98 (1.23–3.19)	0.005
3000–5000	1.38 (1.02–1.85)	0.037	1.39 (1.03–1.88)	0.031
Do farm work				
No	1.00		1	
Yes	0.68 (0.51–0.90)	0.007	0.62 (0.46–0.82)	0.001
Suffering from chronic diseases				
Without	1.00		1	
With	2.23 (1.57–3.17)	< 0.001	2.28 (1.60–3.25)	< 0.001
Participation in group				
Regular	1.00		1	
Never	1.05 (0.70–1.60)	0.804	1.01 (0.67–1.54)	0.955
Occasional	1.14 (0.80–1.61)	0.480	1.10 (0.78–1.57)	0.585
Insomnia				
No	1.00		1	
Yes	1.81 (1.37–2.40)	< 0.001	1.86 (1.40–2.47)	< 0.001
Smoking				
No	1.00		1	
Yes	0.97 (0.64–1.47)	0.890	0.83 (0.52–1.32)	0.430
Drinking				
No	1.00		1	
Yes	0.57 (0.41–0.80)	0.001	0.54 (0.38–0.76)	< 0.001
Total hospitalisations				
0	1.00		1	
1	2.30 (1.64–3.23)	< 0.001	2.23 (1.58–3.14)	< 0.001
2	2.87 (1.92–4.30)	< 0.001	2.82 (1.88–4.24)	< 0.001
IADL				
Independent	1.00		1	
Dependent	1.88 (1.39–2.54)	< 0.001	2.21 (1.61–3.03)	< 0.001
Vision				
Impaired	1.00		1	
Normal	0.67 (0.49–0.91)	0.010	0.65 (0.47–0.88)	0.006
Hearing				
Impaired	1.00		1	
Normal	0.49 (0.36–0.66)	< 0.001	0.47 (0.35–0.64)	< 0.001

* Adjusted for sex and age. CI: confidence interval; IADL: instrumental activities of daily living; OR: odds ratio.

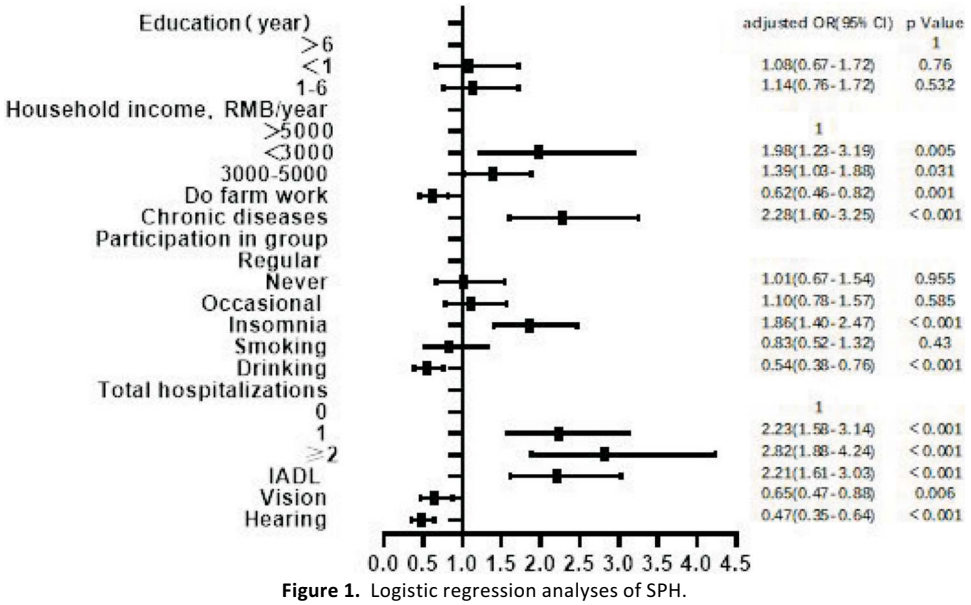

Figure 1. Logistic regression analyses of SPH.

4. Discussion

In this cross-sectional study, the components of SPH were investigated in a sample population from a rural area in Southern China, with emphasis on sociodemographic conditions, health status and health behavioural factors. Poor economic condition, hospitalisation, drinking, vision, hearing, doing farm work, chronic diseases, independent IADL and insomnia showed the strongest associations with SPH.

The close relationship with socioeconomic factors, such as economic condition, has been described in previous studies.[20–22] Multivariable models in the current study demonstrated that economic condition had a key role in explaining perceived health status. Income was positively associated with health, most clearly with the likelihood of avoiding bad health. Studies have indicated the association between health status and education,[23,24] although this relationship was not observed in the current study probably owing to its association with economic condition.

Mäntyselskä et al.[25] found a negative effect of chronic pain on health status in Finland. Chan et al.[26] found that in Malaysia, poor self-assessed health was connected with asthma, arthritis, heart disease and several other illnesses. Arokiasamy et al.[27] confirmed and quantified the relationship between chronic illness and poor self-rated health for a combined data set with observations from China, Ghana, India, Mexico, Russia and South Africa. This study showed that chronic diseases had a significantly negative effect on SPH in the study subjects. It also verified the ability of SPH to predict diseases.

A study on poor self-rated health and hospital service use in Taiwan[28] indicated that OR for the fully adjusted association between poor SPH and hospitalisation was 4.3 (95% CI: 1.9–10.0). Assari et al. found that poor SPH health was associated with hospitalisation and emergency department visits in African American older adults with diabetes.[29] Similarly, this study found that poor self-rated health was associated with hospitalisation. Particularly, the OR value increased when the number of hospitalisations increased. This finding may be explained by the effects of repeated hospitalisations on the physical and mental health of older people.[30]

This study showed that disability in IADL was a risk factor for self-rated health. An investigation on senior people in China indicated that the overall functional disability rate was up to 41.0%, with age-specific rates at 6.9%, 23.6% and 42.7% for respondents aged 65–79, 80–89 and 90–99, respectively.[19] Older persons with ADL and/or IADL limitations are at risk of losing their ability to live independently in the community, resulting in increased demand for healthcare services, nursing home use and other long-term care support. SPH predicted functional decline after two years in older adults without baseline disabilities, and its prognostic ability extended to individual ADL/IADL components. Patterns of SRH – morbidity associations could help health administrators identify those at risk of subsequent functional decline.[31] Tomioka et al.[32] confirmed that SPH is an independent predictor of IADL decline amongst non-disabled community-dwelling older adults, and that SPH is an effective tool for identifying older people with future risk for IADL decline.

This study suggested that insomnia is the factor that exerted the greatest effect on SPH in patients. The results are consistent with those of Magee, who found a strong relationship between bad SPH and short sleep duration.[33] Prevalence of sleep disorders increases with age.[34,35] A study that included over 16,000 elders from developing countries have found that the prevalence of sleep disorders ranges from 9.1% to 37.7%.[36] Related aging strategies could start from improving their sleep.

Normal hearing and visual acuity have a positive effect on self-rated health in older adults, consistent with previous studies.[37,38] This study showed that older adults who do farm work had more positive self-reports of health than those who do not, similar to the results of a study.[39] Low physical activity is one of the major risk factors for a range of conditions in older age; it could represent an individual's state of poor functionality or mental wellbeing. Therefore, older adults who may be performing low physical activity could be more likely to have poor SPH. We also found that older people who drink had better SPH than those who do not. Riediger et al. suggested that amongst women, those who reported heavy episodic drinking (OR = 2.64) or daily drinking (OR = 3.51) rated their health as better than those who reported low risk.[40] A study on alcohol drinking pattern and subjective health has shown that moderate drinking is beneficial for health.[41]

This study has the following advantages. Firstly, the study population was the minority rural older people in Southern China; only a few studies have focused on this population. Secondly, this study included the number of hospitalisations in the independent variable analysis, whereas previous studies have only focused on the impact of recent hospitalisations. The results of the current study showed that the self-rated health of the elderly was worse with an increase in hospitalisation frequency. However, the current study has certain limitations that should be considered. The measure of health condition (implied by the presence of any chronic disease) and most of the other measures were self-reported, subjecting them to recall bias and underestimation of their effects on SPH. More precise questions, including additional factors, should be considered for future studies. Lastly, cross-sectional design limits any inference on the direction of relationships amongst variables or causality inference. Longitudinal studies are needed to track changes over time.

5. Conclusion

SPH of older people was correlated to sociodemographic status, health status and healthy behaviour. Poor financial status, hospitalisation, chronic diseases, independent IADL and insomnia were likely to cause bad SPH. Future longitudinal studies should examine whether or not SPH could screen for health risk factors to reduce unnecessary medical care use. These findings will be useful for future improvement in older people's subjective well-being and objective health of older people in rural region. It is recommended that the implementation of poverty alleviation policies, rural preventive healthcare coverage.

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Conflict of interest

The authors declared no conflict of interest.

References

1. Freidoony L, Chhabi R, Kim CS, et al. The components of self-perceived

health in the Kailali district of Nepal: a cross-sectional survey. *Int J Environ Res Public Health*. 2015;12(3):3215–3231.
2. Jradi H, Alharbi Z, Mohammad Y. Self-rated health among Saudi women: Association with morbidity, lifestyle, and psychosocial factors. *J Epidemiol Glob Health*. 2018;8(3–4):183–188.
3. Jylhä M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Soc Sci Med*. 2009;69(3):307–316.
4. Ihász F, Schulteisz N, Finn KJ, et al. Associations between fitness levels and self-perceived health-related quality of life in community - dwelling for a group of older females. *BMC Public Health*. 2020;20(Suppl 1):1057.
5. Bath PA. Self-rated health as a risk factor for prescribed drug use and future health and social service use in older people. *J Gerontol A Biol Sci Med Sci*. 1999;54(11):M565–M570.
6. Fernandez-Martinez B, Prieto-Flores ME, Forjaz MJ, et al. Self-perceived health status in older adults: regional and sociodemographic inequalities in Spain. *Rev Saude Publica*. 2012;46(2):310–319.
7. Silva J, Truzzi A, Schaustz F, et al. Impact of insomnia on self-perceived health in the elderly. *Arq Neuropsiquiatr.* 2017;75(5):277–281.
8. Jerez-Roig J, Souza DL, Andrade FL, et al. Self-perceived health in institutionalized elderly. *Cien Saude Colet*. 2016;21(11):3367–3375.
9. Aida Abusalehi MV-S, Esmaily H, Jafari A, et al. Mental health promotion of the elderly in nursing homes: A social-cognitive intervention. *Int J Gerontol*. 2021;15(3):221–227.
10. Machón M, Vergara I, Dorronsoro M, et al. Self-perceived health in functionally independent older people: associated factors. *BMC Geriatr.* 2016;16:66.
11. Kaleta D, Makowiec-Dabrowska T, Dziankowska-Zaborszczyk E, et al. Physical activity and self-perceived health status. *Int J Occup Med Environ Health*. 2006;19(1):61–69.
12. Shields M, Shooshtari S. Determinants of self-perceived health. *Health Rep.* 2001;13(1):35–52.
13. Martins-Silva T, Hirschmann R, Bortolotto CC, et al. Health self-perception and morbidities, and their relation with rural work in southern Brazil. *Rural Remote Health*. 2020;20(1):5424.
14. Ma C, Song Z, Zong Q. Urban-rural inequality of opportunity in health care: Evidence from China. *Int J Environ Res Public Health*. 2021;18(15):7792.
15. Pantyley V. Health inequalities among rural and urban population of Eastern Poland in the context of sustainable development. *Ann Agric Environ Med*. 2017;24(3):477–483.
16. Zhang YL, Wu BJ, Chen P, et al. The self-rated health status and key influencing factors in middle-aged and elderly: Evidence from the CHARLS. *Medicine (Baltimore)*. 2021;100(46):e27772.
17. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9(3):179–186.
18. Chen S, Qin J, Li Y, et al. Disability and its influencing factors among the elderly in a County, Guangxi Province, China. *Int J Environ Res Public Health*. 2018;15(9):1967.
19. Zhang Y, Xiong Y, Yu Q, et al. The activity of daily living (ADL) subgroups and health impairment among Chinese elderly: a latent profile analysis. *BMC Geriatr.* 2021;21(1):30.
20. Hong J, Lee J. Decomposing income-related inequalities in self-reported depression and self-rated health among married immigrants in South Korea. *Int J Environ Res Public Health*. 2019;16(10):1869.
21. Alexopoulos EC, Geitona M. Self-rated health: inequalities and potential determinants. *Int J Environ Res Public Health*. 2009;6(9):2456–2469.
22. Navarro RM, Salazar-Fernández C, Schnettler B, et al. The influence of financial situation and friends' support on health self-perception of older adults. *Rev Med Chil*. 2020;148(2):196–203.
23. Jang Y, Choi EY, Rhee MK, et al. Determinants of self-rated cognitive health among older Korean Americans. *Gerontologist*. 2020;60(2):250–258.
24. Janković J, Janević T, von dem Knesebeck O. Socioeconomic inequalities, health damaging behavior, and self-perceived health in Serbia: a cross-sectional study. *Croat Med J*. 2012;53(3):254–262.
25. Mäntyselkä PT, Turunen JH, Ahonen RS, et al. Chronic pain and poor self-rated health. *JAMA*. 2003;290(18):2435–2442.
26. Chan YY, Teh CH, Lim KK, et al. Lifestyle, chronic diseases and self-rated health among Malaysian adults: results from the 2011 National Health and Morbidity Survey (NHMS). *BMC Public Health*. 2015;15:754.
27. Arokiasamy P, Uttamacharya U, Jain K, et al. The impact of multimorbidity on adult physical and mental health in low- and middle-income countries: what does the study on global ageing and adult health (SAGE) reveal? *BMC Med*. 2015;13:178.
28. Isaac V, McLachlan CS, Baune BT, et al. Poor self-rated health influences hospital service use in hospitalized inpatients with chronic conditions in Taiwan. *Medicine (Baltimore)*. 2015;94(36):e1477.
29. Assari S, Smith J, Bazargan M. Poor self-rated health is associated with hospitalization and emergency department visits in African American older adults with diabetes. *J Racial Ethn Health Disparities*. 2020;7(5):880–887.
30. Gur-Yaish N, Zisberg A, Sinoff G, et al. Effects of instrumental and psychological support on levels of depressive symptoms for hospitalized older adults. *Aging Ment Health*. 2013;17(5):646–653.
31. Fong JH, Kok ZC. Does subjective health matter? Predicting overall and specific ADL disability incidence. *Arch Gerontol Geriatr.* 2020;90:104169.
32. Tomioka K, Kurumatani N, Hosoi H. Self-rated health predicts decline in instrumental activities of daily living among high-functioning community-dwelling older people. *Age Ageing*. 2017;46(2):265–270.
33. Magee CA, Caputi P, Iverson DC. Relationships between self-rated health, quality of life and sleep duration in middle aged and elderly Australians. *Sleep Med*. 2011;12(4):346–350.
34. Crowley K. Sleep and sleep disorders in older adults. *Neuropsychol Rev.* 2011;21(1):41–53.
35. Roepke SK, Ancoli-Israel S. Sleep disorders in the elderly. *Indian J Med Res*. 2010; 131:302–310.
36. Mazzotti DR, Guindalini C, Sosa AL, et al. Prevalence and correlates for sleep complaints in older adults in low and middle income countries: a 10/66 Dementia Research Group study. *Sleep Med*. 2012;13(6):697–702.
37. Lisko I, Törmäkangas T, Jylhä M. Structure of self-rated health among the oldest old: Analyses in the total population and those living with dementia. *SSM Popul Health*. 2020;11:100567.
38. Liu PL, Cohen HJ, Fillenbaum GG, et al. Association of co-existing impairments in cognition and self-rated vision and hearing with health outcomes in older adults. *Gerontol Geriatr Med*. 2016;2:2333721415623495.
39. An HY, Chen W, Wang CW, et al. The relationships between physical activity and life satisfaction and happiness among young, middle-aged, and older adults. *Int J Environ Res Public Health*. 2020;17(13):4817.
40. Riediger ND, Bombak AE, Mudryj AN. Health-related behaviours and their relationship with self-rated health among Canadian adults. *BMC Public Health*. 2019;19(1):960.
41. Stranges S, Notaro J, Freudenheim JL, et al. Alcohol drinking pattern and subjective health in a population-based study. *Addiction*. 2006;101(9):1265–1276.