

REVIEW AND PROSPECT OF RESEARCH ON SOCIAL VULNERABILITY OF THE ELDERLY

Zou Meijing

International Affairs and Public Administration, Ocean University of China, Qingdao, China

Abstracts: The scale of China's elderly population is growing rapidly, it is imperative to build an agefriendly society. Identifying the social vulnerability of older persons to vulnerable situations in society seems important. This paper uses literature analysis to systematically review the concept, evaluation methods and indicator system, influencing factors and recent progress of the social vulnerability of the elderly, and makes a future outlook on this basis. The study found that the concept of social vulnerability of the elderly has not yet reached a unified consensus, the indicator system lacks comprehensiveness and pertinence. The article argues that the social vulnerability of older persons refers to the possibility of vulnerability under the influence of multiple factors, involving the interaction between various socioeconomic, political and cultural conditions and individuals. Future research should focus on the "systemcomprehensive" perspective for comprehensive analysis, further promote the research of method diversification and group differentiation, and gradually construct the theory of social vulnerability of the elderly based on Chinese scenarios.

Keywords: seniors; social vulnerability; health poverty; natural disaster

1. Introduction

The problem of population aging is becoming increasingly prominent, and the proportion of the elderly population in China's total population is increasing year by year. According to the data of the seventh national census, the elderly population over 60 years old in China is 264.02 million, accounting for 18.7% of the total population, and the population aged 65 and above is 190.64 million, accounting for 13.5% of the total population. At the same time, the number of disabled and semi-disabled elderly people has reached 40.63 million, and more and more elderly people are facing the problem of providing for the elderly. Aging leads to a decline in physical function, a decrease in the ability to resist risks, and an increase in vulnerability, which affects the well-being of the elderly in their later years. The report of the 20th National Congress of the Communist Party of China pointed out that it is necessary to implement the people-centered development concept, and continue to make efforts to improve people's lives in an all-round way by providing medical treatment, providing for the elderly, housing and supporting the weak.

The elderly are a vulnerable group in society and need the attention and support of all sectors of society. At present, the number of empty nesters and lonely elderly people in China is increasing day by day, and their old age and frailty make them vulnerable in society, become fragile and helpless, and fall into a life dilemma. Therefore, the social vulnerability of the elderly deserves further attention, and reducing the social vulnerability of the elderly is of great significance for building an age-friendly society and achieving healthy aging. By assessing the social vulnerability of the elderly and identifying the influencing factors of the social vulnerability

of the elderly, the vulnerability of the elderly can be understood, so as to facilitate the formulation of reasonable security policies.

Based on Google Scholar, CNKI, VIP and other databases, this paper uses keywords such as "elderly + vulnerable" and "elderly + social vulnerable" to collect, systematically sort out and summarize the literature. Based on domestic and foreign research, it has been found that the research on the social vulnerability of the elderly has achieved rich results, and the attention to the social vulnerability of the elderly is increasing.

2. Research on the concept of social vulnerability of the elderly

2.1. The origin and development of the concept of social vulnerability of the elderly

Social vulnerability originated from the study of vulnerability. Vulnerability is defined as "the likelihood of a loss occurring". Since the 80s of the 20th century, the study of vulnerability has gradually expanded from the fields of catastrophology and environmental science to the fields of sociology, medicine and anthropology. Chambers (1989) argues that vulnerability can be seen as a way of identifying the impact of difficult situations on people and how people respond to them.^[1] Vulnerability stems from susceptibility to danger and is closely related to human activities. As the influence of social factors on human vulnerability is becoming more and more prominent, the study of vulnerability has gradually been deeply studied by the academic community with the new development trend of social vulnerability. Social vulnerability is based on the perspective of natural and social systems, and is a further expansion of the research field and scope of vulnerability.

In recent years, more and more scholars have carried out research focusing on the social vulnerability of the elderly. The study of social vulnerability is usually based on the social attributes of human beings, and excavates the insecurity and instability of human beings under the influence of social structure and policy changes. Although there is no consensus on the concept of social vulnerability of the elderly, the research on the concept of social vulnerability of the elderly has also achieved rich results. At the beginning of the 21st century, conceptual research on the social vulnerability of older persons began to emerge, with Butterfill and Marianti (2006) describing the social vulnerability of older persons as an interplay between biological and social threats, personal characteristics and resources, social relationships, and broader economic, political, and cultural structures.^[2] The social vulnerability of older people is the result of their weak defenses against potential harm in the social system, and older people are more vulnerable than other age groups. Subsequently, the concept of vulnerability of older persons has been broadly interpreted as "vulnerable individuals" and "the degree of vulnerability to exploitation". Since 2010, the research on the concept of social vulnerability of the elderly has been further developed and the connotation has become more profound. Gerontologists Dyer and Ostwald (2011) define geriatric vulnerability as "an increase in vulnerability when older people exhibit physical or mental deterioration, which may (or may not) compensate for by changing the social environment or improving medical care."^[3] Vulnerability to old age occurs with the state of ageing and is cumulative and irreversible, but can be mitigated through a range of compensatory measures. Subsequently, Luna (2014) proposed that the social vulnerability of older persons is "the interaction of socioeconomic or social difficulties that may interact with an individual or group of individuals experiencing one or more physiological and psychological factors at a given moment, increasing their risk of harm, or coping with challenges that negatively impact their lives"^[4], suggesting that old-age vulnerability is long-term and the result of the cross-action of various complex factors. Based on the existing research, this paper argues that the concept of social vulnerability of the elderly can be understood in two aspects: narrow and broad, from the narrow sense, it refers to the susceptibility of the elderly to harm in the process of interpersonal communication

and social interaction and a series of adverse effects brought about by it; Broadly speaking, the social vulnerability of older persons refers to the potential for vulnerability to a variety of factors, involving the interaction between various socio-economic, political and cultural conditions and individuals.

2.2. The basic dimensions of the social vulnerability of the elderly

With the development of conceptual research, the academic community has also carried out research on the dimensions of social vulnerability of the elderly. Van et al. (2008) summarized the dimensions of social vulnerability in older adults into three dimensions, the first dimension refers to the loss of individual function; The second dimension relates to family resources and the use of resources to compensate for the individual's limitations; The third dimension refers to the adequacy of the environment in which the elderly live and the compensation mechanism of the local environment for the individual.^[5] Luna (2014) conducted extensive research on the dimensions of social vulnerability of older people, and proposed seven levels of vulnerability, including economic vulnerability, justice system vulnerability, housing vulnerability, communication (information) vulnerability, interpersonal vulnerability, emotional vulnerability, and cognitive vulnerability.^[4] Although scholars have constructed many analytical dimensions of the social vulnerability of older adults, the more influential one is that Zaman (2019) identified five types of vulnerability in the book *Angry Planet: Disasters from an Anthropological Perspective*, proposing that the social vulnerability of older adults includes five dimensions: physical vulnerability, economic vulnerability, social vulnerability, educational or information vulnerability, and environmental vulnerability.^[6] Combined with the disaster background, the elements and characteristics of vulnerability in each dimension are elaborated in detail, which provides a rich perspective for the assessment of social vulnerability of the elderly.

3. Research on the evaluation method and evaluation index system of the social vulnerability of the elderly

3.1. Methods for assessing the social vulnerability of the elderly

Assessing the degree of social vulnerability of older persons is an important part of understanding the degree of frailty and health status of older persons. Although in recent years, some scholars have used qualitative research methods such as case studies, focus group discussions, and interviews to study the social vulnerability of the elderly, such as Malak et al. (2020), who conducted a detailed investigation on the vulnerability and adaptation strategies of the elderly in coastal areas of Bangladesh in the face of hurricanes through interviews and focus group discussions.^[7] However, the vast majority of existing studies still follow the research method of quantitative assessment, using scale scoring methods, index calculation methods and other methods to assess the social vulnerability of older adults. At present, the most noteworthy index calculation method is the Social Vulnerability Index (SVI) of the Elderly developed by the Canadian Health and Ageing Research Project (CSHA), which includes seven indicators: self-esteem, sense of control, living status, participation in social activities, social support, and interpersonal relationships^[8], which can comprehensively assess the vulnerability of the elderly, and is the most authoritative and influential index calculation method for assessing the social vulnerability of the elderly.

3.2. Evaluation index system for the social vulnerability of the elderly

Based on the existing literature at home and abroad, it is found that the research on the indicator system of social vulnerability of the elderly is still progressing slowly, and there are few studies on the indicator system of social vulnerability of the elderly. The representative study is the index system constructed by Xu Jie et al. (2019) to

assess the family pension vulnerability of the elderly in rural areas, based on the three first-level indicators of "exposure-sensitivity-adaptability" and 26 specific indicators (natural, social, and family) risk, income, health, and livelihood capital (natural, human, financial, social, and material).^[9] However, this indicator system is only for a specific topic, and with the further development of research on the assessment of the social vulnerability of the elderly, there is an urgent need to develop an indicator system to assess the social vulnerability of the elderly from all aspects of the social life of the elderly. At present, most of the assessment studies usually use assessment tools such as the Assessment of the Elderly (EAI), the Perceived Vulnerability Scale (PVS), the Edmonton Frailty Scale (EFS), and the Vulnerable Elderly Survey (VES-13).

3.3. Research on the influencing factors of social vulnerability of the elderly

3.3.1. Individual factors

Age, gender, region, health status, and family structure are the influencing factors of social vulnerability of the elderly. Some studies have shown that with the extension of life expectancy, the incidence of underlying diseases in the elderly also increases, and the social vulnerability of the elderly with underlying diseases and imperfect physical functions is more significant.^[10] Vulnerability not only increases with age, but also varies between older men and women. Golaz and Rutaremwa (2011) found that older women are more vulnerable in life and need greater support.^[11] Although differences in individual physiological structure have a great impact on the social vulnerability of older persons, the daily care of family members can lead to a reduction in the vulnerability of older persons. Family accessibility can be seen as a protective factor for ageing, and vulnerability, loneliness, depression, and poor health in older people are strongly associated with access to kinship.^[12] Older people who live alone are more likely to fall into a state of vulnerability in the absence of adequate family resources and care support.^[11]

3.3.2. Social factors

Social factors of the vulnerability of older persons include educational attainment, socioeconomic status, social capital, social networks, social support, etc. Studies have shown that low pensions, inadequate social conditions, low educational attainment, and little community participation are all conditions that induce vulnerability among older people.^[12] Older persons are often vulnerable to social exclusion and ageism in society, and are actively excluded from equal opportunities in employment, politics, community and recreational activities", becoming a socially marginalized group.^[13] Older people, in particular, who are less educated, are more susceptible to unhealthy psychological conditions, social exclusion, less access to information, and unfavourable socio-economic conditions.^[14] The accumulation of various social factors exacerbates the risk of social vulnerability of older persons. In addition, social capital, as a direct social resource embedded in individual social networks, is an informal social support to promote the health and well-being of the elderly.^[15] Good social networks and sufficient social capital provide emergency rescue and daily life assistance for the elderly, enhance the risk resilience of the elderly, and thus reduce the social vulnerability of the elderly.

3.3.3. Environmental factors

Changes in the ecological environment and human settlements are important factors that exacerbate the social vulnerability of the elderly. On the one hand, the ecological environment affects the survival and health of human beings. Many middle-aged and older people living in wetland communities are more vulnerable, which is associated with higher levels of sleep disturbance and malnutrition.^[16] In terms of vulnerability in the public health sector, the health vulnerability of older adults is related to exposure to hazardous waste and other toxic substances,

exposure to environmental and indoor air pollutants, and is also related to water quality, environmental noise, residential congestion, and environmental pollution^[17] On the other hand, human settlements affect the quality of human life and life. Odufuwa (2010) identified the vulnerability of mobility pressures and traffic insecurity among the older population, and the lack of transport infrastructure and services to integrate the mobility needs of vulnerable groups into the planning and implementation of transport infrastructure^[18] Moreover, rural areas are more vulnerable to health conditions than urban and suburban areas, where economic conditions are poorer, education levels are lower, and access to health care is less^[19] The establishment and improvement of infrastructure can provide medical and legal support for the elderly, which is of great significance to reduce the vulnerability of the elderly to disasters.

4. Recent progress in research on the social vulnerability of the elderly

At present, the research on the social vulnerability of the elderly has achieved rich research results, and the content of the social vulnerability of the elderly under the influence of health, poverty and disaster is sorted out and summarized from the three research perspectives of health vulnerability, poverty vulnerability and disaster vulnerability.

4.1. Health vulnerability of the elderly

Judging from the existing research, the academic community mainly studies the health vulnerability of the elderly from three aspects. The first is to study the health vulnerability of older people under the influence of climate change. Extreme heat events caused by climate change have a negative impact on the health of older people. Kim and Joh (2006) studied the relationship between high temperature and the vulnerability of low-income older adults and found that low income and aging have a potential impact on heat-induced mortality, and that low-income and older populations may be vulnerable to heat.^[20] Gronlund (2014) found that extreme heat is strongly associated with respiratory and kidney diseases when studying heat waves and hospitalizations in the elderly in the United States.^[21] The second is to focus on the health vulnerability of special elderly populations. Yan Yueping (2022) studied the multidimensional health vulnerability of the elderly living alone and found that compared with the nonelderly living alone, the elderly living alone faced multiple vulnerabilities in physical and mental aspects, especially in emotional depression.^[22] The third is to carry out research on the improvement strategies of the health vulnerability of the elderly from the perspective of social support. Zhang Yongqi (2022) studied the relationship between social capital and the health vulnerability of poor rural households, and found that the quantity and quality of social capital have a significant impact on the physical vulnerability, psychological vulnerability, and social vulnerability of poor rural households.^[23] Deng Dasong and Feng Yandong (2021) studied the alleviating effect of community elderly care services on the health vulnerability of the elderly, and constructed the transmission path of "community elderly care servicesanti-fragility ability-physiological health vulnerability-mental health vulnerability" to eliminate the health vulnerability of the elderly.^[24] At present, scholars have made rich achievements in the study of health vulnerability, but the research on the formation mechanism of health vulnerability and antifragility improvement strategies of the elderly still needs to be deeply explored and explored.

4.2. Poverty vulnerability of the elderly

The study of poverty vulnerability has been widely concerned by the academic community, and the research community on the poverty vulnerability of the elderly has mainly studied from the following three aspects. The first is to study the influencing factors of poverty vulnerability of the elderly. He Xin et al. (2020) found that

residential patterns have a significant impact on the poverty vulnerability of the rural elderly population, and the elderly living alone are more likely to fall into poverty.^[25] The second is the study of the improvement mechanism of poverty vulnerability from the perspective of sustainable livelihoods. Li Xueping (2015) proposed an "action-structure" analytical framework to solve multidimensional poverty based on three analytical frameworks: sustainable livelihoods, vulnerability, and social exclusion.^[26] Feng Jiao (2018) measured the poverty vulnerability of rural households by constructing an evaluation index system of "risk-livelihood capital-adaptive capacity", and believed that the key measure to solve the vulnerability of poor rural households is to improve livelihood diversity and risk coping capacity.^[27] The third is to study the effect of the social security system on the poverty vulnerability of the elderly. Wang Xiuhua et al. (2021) studied the impact of rural endowment insurance on the poverty vulnerability of elderly families and found that rural endowment insurance has a significant role in improving the poverty vulnerability of elderly families.^[28] Some scholars have conducted further research on the poverty vulnerability of rural households in the two stages of NESS payment and entrapment based on two different types of poverty standards, and found that NESS payment has a significant weakening effect on rural low-income families, and receiving NEPS has exacerbated the family poverty vulnerability of rural elderly to a certain extent.^[29] In summary, the research on the poverty vulnerability of the elderly has gradually matured, but the current research on the poverty vulnerability of the elderly is limited to rural areas, and the research on the poverty vulnerability of the elderly in urban and rural areas is still insufficient. Studies have shown that the economic vulnerability of older households is higher than that of poverty, and the proportion of non-poor households is also increasing, and older people face widespread economic vulnerability. Therefore, future research should focus on expanding the research scope of poverty vulnerability and paying attention to the impact of risk factors on poverty vulnerability.

4.3. Disaster vulnerability of the elderly

In recent years, the study of the social vulnerability of older people in disaster situations has become a new field of research. Scholars have studied the disaster vulnerability of the elderly mainly from the perspective of disaster type and disaster development stage. On the one hand, research on the vulnerability of older persons to different types of disasters should be carried out. Malak (2020) examines the vulnerability of older adults to floods and finds that older people are more vulnerable than younger people in terms of physical, human, social, cultural and financial assets, and have specific types of medical care (appropriate to their age, medical and dietary needs).^[7] Durant (2011) examined the vulnerability of older adults in Hurricane Khatri and found that hurricanes have negative effects on older adults such as low socioeconomic status, impaired physical or mental abilities, and impaired or disrupted social networks and support systems.^[30] Wang (2012) studied the vulnerability of older people during hurricanes and found that older people in nursing homes were more physically and mentally more vulnerable and helpless when hurricanes came.^[19] On the other hand, the focus is on the vulnerability of older persons at different stages of disaster. Studies have shown that patients with chronic diseases at home and older patients may experience greater difficulty in rescuing, rescue, and evacuate to nonhazardous locations due to functional limitations and disabilities^[31], and are more vulnerable in disasters. There are also studies that look at the long-term vulnerability of older persons in the aftermath of disasters. Studies have shown that older adults with physical or cognitive disabilities, as well as those with low incomes or no social support networks, are the most at risk of injury, death, or developing post-disaster health problems.^[32] Joseph (2021) pointed out that the tsunami adversely affected the social status, mental health quality, assets and social relationships of the elderly,

and that the elderly were more likely to suffer from fatigue, sadness, frequent minor illnesses, vague physical symptoms, and loss of vitality.^[33] In summary, although satisfactory progress has been made in the study of the disaster vulnerability of the elderly, the vast majority of studies on the United States, India and other regions cannot fully reflect the global vulnerability of the elderly to disasters.

5. Conclusions and Implications

In recent years, the research on the social vulnerability of the elderly has been increasing, and the study of the social vulnerability of the elderly has become an emerging research field. The concept of social vulnerability of the elderly has become a comprehensive study in terms of the complexity of the social system and the susceptibility of individuals, but the unified definition of the concept of social vulnerability of the elderly has not yet been completed. Secondly, from the perspective of the assessment of social vulnerability of the elderly, due to the difference in concepts and different research emphases, researchers will choose a variety of scales and tools to assess the vulnerability of the elderly at the same time when studying the vulnerability of the elderly, and there is a lack of a special and comprehensive evaluation index system to measure the vulnerability of the elderly. Finally, from the perspective of the latest progress of the social vulnerability of the elderly, the research on the social vulnerability of the elderly currently focuses on the research related to health vulnerability and poverty vulnerability, focusing on the research in the normalized context, but with the frequent occurrence of natural disasters and public crisis events, the future research on the social vulnerability of the elderly needs to focus on the research in special situations. Based on the systematic review of domestic and foreign literature, in order to promote the research on the social vulnerability of the elderly in China to be more professional and pertinent, this paper proposes three directions for strengthening in the future:

First, a comprehensive analysis that focuses on a "system-comprehensive" perspective. Judging from the existing literature in China, the social vulnerability of the elderly in China is still in its infancy. From a micro perspective, the research focuses on a specific aspect of the vulnerability of the elderly group, but lacks a dynamic and comprehensive grasp of the social vulnerability of the elderly from the perspective of the macro social and ecological system. However, from a macro perspective, the research on the impact of macro environment and macro policies on the elderly lacks a detailed analysis of the social vulnerability of the elderly group, and falls into a state of "utopia". In the future, the relevant research on the social vulnerability of the elderly should focus on a systematic and comprehensive analysis, which should not only comprehensively analyze the social vulnerability of the elderly in combination with social structure, institutional culture, economic development, etc., but also focus on the trend change of the social vulnerability of the elderly caused by the occurrence of disaster risk. It is necessary not only to pay attention to the impact of policy changes on the social vulnerability of the elderly, but also to carry out real investigation and research on vulnerability based on the real situation of the elderly, so as to form a scientific and comprehensive analysis, enhance the explanatory power of the content, and improve the practical significance of the research on the social vulnerability of the elderly.

Second, we should further promote the research on method diversification and group differentiation. There is no standard way to measure the complexity and diversity of social vulnerability of older persons. Research on different issues, different regions and different fields requires different combinations of elements, and domestic research needs to further promote the diversification of methods, promote the innovation of quantitative methods for the social vulnerability of the elderly, strengthen the research of qualitative methods, and select targeted research methods according to the topics of health, elderly care, livelihood and other topics. In addition, the next

research also needs to pay attention to the differentiation within the elderly group, pay attention to the differences in vulnerability caused by the heterogeneity of the elderly group, and promote the in-depth research on the social vulnerability of the elderly. In the future, no matter what methods and means are used to assess the social vulnerability of the elderly, differentiated research should be carried out according to different topics and different elderly groups, so as to achieve more localized research results.

Thirdly, the theory of social vulnerability of the elderly based on the Chinese scenario should be gradually constructed. The research on the social vulnerability of the elderly started early, and rich research work has been carried out across many disciplines such as disaster science, environmental science, geriatrics science and medicine, and public health. Different from other countries, the research on the social vulnerability of the elderly in China started late, and faced with the problems of immature theories and methods, insufficient attention to disaster social disciplines, and unclear practical application orientation, so it is necessary to strengthen the research on the localized theories, methods and safeguard policies of the social vulnerability of the elderly. At the same time, on the basis of theoretical research, we should strengthen practical and applied research, focusing on how to reduce the social vulnerability of the elderly in China through scientific theoretical knowledge and reasonable security policies, focusing on the formation and evolution mechanism of the social vulnerability of the disabled and living alone elderly, and paying attention to the social vulnerability and improvement strategies of the elderly in China in disaster situations, so as to provide a scientific decision-making basis for the sustainable development of the elderly.

References

- Chambers, R.(2010). Vulnerability, coping and policy (editorial introduction). *Ids Bulletin*, 37(4), 33-40.
- Schröder-Butterfill, E. & Marianti, R.(2006). A framework for understanding old-age vulnerabilities. *Ageing and Society*,26,9-35.
- Ostwald S, Dyer C.(2011). Fostering resilience, promoting health and preventing disease in older adults. In: Stuart-Hamilton I, ed. *An Introduction to Gerontology*. Cambridge University Press;48-86.
- Luna F.(2014). 'Vulnerability',an interesting concept for public health: the case of older persons. *Public Health Ethics*,7(2):180-194.
- Van Der Meer M, Fortuijn J D, Thissen F. (2008).Vulnerability and environmental stress of older adults in deprived neighbourhoods in the Netherlands. *Tijdschrift voor economische en sociale geografie*, 99(1): 53-64.
- Zaman M Q.(2019). *Vulnerability, Disaster, and Survival in Bangladesh: Three Case Studies 1 The angry earth*. Routledge,162-177.
- Malak M A, Sajib A M, Quader M A, et al.(2020). “We are feeling older than our age”: Vulnerability and adaptive strategies of aging people to cyclones in coastal Bangladesh. *International Journal of Disaster Risk Reduction*,48: 101595.

- Andrew M K, Keefe J M.(2014) Social vulnerability from a social ecology perspective: a cohort study of older adults from the National Population Health Survey of Canada. *BMC geriatrics*,14(1): 1-14. [9] Xu Jie, Li Shuzhuo, Wu Zheng, Liu Wei. (2019)." Assessment of the Vulnerability of Rural Elderly Families to the Elderly: An Empirical Study Based on Rural Areas in Anhui Province", *Population Research*, No. 1.
- Cruz R R, Beltrame V, Dallacosta F M.(2019). Aging and vulnerability: an analysis of 1,062 elderly persons. *Revista Brasileira de Geriatria e Gerontologia*, 22.
- Golaz V, Rutaremwa G.(2011). The vulnerability of older adults: what do census data say? An application to Uganda. *African Population Studies*,25(2).
- Barbosa K T F, Oliveira F M R L; Fernandes M G M.(2019). Vulnerability of the elderly: a conceptual analysis. *Revista brasileira de enfermagem*, 72: 337-344.
- Brocklehurst H, Laurenson M. (2008).A concept analysis examining the vulnerability of older people. *British Journal of Nursing*, 17(21): 1354-1357.
- Generoso F K, Jesus I T M, Zazzetta M S. (2017).Evaluation of Frailty and Social Support of the Elderly in the Context of Social Vulnerability: A Study in Rural Area. *Nurse Care Open Acces J*,4(3): 00107.
- Jiang Haochen, Gao Jiamin.(2021). Empirical Research and Policy Reflections on Subjective Evaluation of Relative Poverty and Mental Health and Life Satisfaction of the Elderly, *Population and Development* (05 vo 27), 24–35.
- Generoso F K, Jesus I T M, Zazzetta M S. (2017). Evaluation of Frailty and Social Support of the Elderly in the Context of Social Vulnerability: A Study in Rural Area. *Nurse Care Open Acces J*, 4(3): 00107.
- Fuller A T, Pincetl S.(2015). Vulnerability studies: A bibliometric review. *The Professional Geographer*,67(3): 319-329.
- Odufuwa B O.(2010). Vulnerability and mobility stress coping measures of the aged in a developing city. *European Journal of Social Sciences*,13(1): 25-33.
- Wang C, Yarnal B.(2012). The vulnerability of the elderly to hurricane hazards in Sarasota, Florida. *Natural hazards*, 63: 349-373.
- Kim Y, Joh S.(2006). A vulnerability study of the low-income elderly in the context of high temperature and mortality in Seoul, Korea. *Science of the total environment*,371(1-3): 82-88. [21] Gronlund C J, Zanolotti A, Schwartz J D, et al.(2014). Heat, heat waves, and hospital admissions among the elderly in the United States, 1992-2006. *Environmental health perspectives*, 122(11): 11871192.
- Yan Yueping, Li Yalin. (2022). A Study on the Multidimensional Health Vulnerability of the Elderly Living Alone: An Empirical Analysis Based on the Longitudinal Survey on the Influencing Factors of Elderly

Health in China, Journal of Yunnan University for Nationalities (Philosophy and Social Science) (04 vo 39), 64–75.

Zhang Yongqi.(2022). Social Capital and the Health Vulnerability of Poor Rural Households: Inhibition or Promotion? -Based on the data of the China Household Panel Survey, Xinjiang Agricultural Reclamation Economy (06), 1-9.

Deng Dasong, Feng Yandong.(2021). Does Community Elderly Care Service Alleviate the Health Vulnerability of the Elderly in China?, Journal of Hubei University (Philosophy and Social Science) (05 VO 48), 150-159+169.

He Xin, Huang Xinbo; Zhou Yuhong.(2020). Residential Patterns, Income Structure and Poverty Vulnerability of Rural Elderly Population, China Rural Economy (06), 126–44.

Li Xueping, Wang Meng.(2015).The Construction of the Analytical Framework of Multidimensional Poverty" Action-Structure": Based on the Integration of Three Analytical Frameworks of Sustainable Livelihood, Vulnerability and Social Exclusion", Journal of Jiangnan University (Social Science Edition), No. 3.

Feng Jiao, Chen Yong, Zhou Lihua, Hou Caixia, Wang Rui.(2018). A Study on the Vulnerability of Poor Farmers Based on a Sustainable Livelihood Analysis Framework: A Case Study of Pingshang Village, Minxian County, Gansu Province, Chinese Journal of Eco-Agriculture (11 vo 26), 1752–62. [28] Wang Xiuhua, Zhang Hao.(2021).Can Rural Pension Insurance Improve the Poverty Vulnerability of Elderly Families? , Journal of Accounting and Economics (01 vo 35), 92–109.

Wang Jianying, He Bing, Bi Jieying.(2022). New Rural Social Security and Poverty Vulnerability of Rural Low-income Households: Based on the Background of Targeted Poverty Alleviation and Different Poverty Standards, Economic Theory and Economic Management, 85–99.

Durant Jr T J. (2011). The utility of vulnerability and social capital theories in studying the impact of Hurricane Katrina on the elderly. Journal of Family Issues, 32(10): 1285-1302.

Eldar R.(1991). Vulnerability of disabled and elderly in disasters: Case-study of israel during 'desert storm'. Medicine, Conflict and Survival,7(4): 269-274.

Maltais D.(2019). Elderly people with disabilities and natural disasters: vulnerability of seniors and post trauma. HSOA Journal of gerontology & geriatric medicine, 5(4): 1-7.

Joseph J, Jaswal S.(2021). Elderly and Disaster Mental Health: Understanding Older Persons' Vulnerability and Psychosocial Well-Being Two Years after Tsunami. Ageing international,46: 235-252.