

A Comparative Study on the Current Status and Influencing Factors of Subjective Cognitive Decline among Urban and Rural Elderly in the Xinjiang Region (Postprint)

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Abstract

Background: Subjective cognitive decline (SCD) represents an asymptomatic preclinical stage of Alzheimer's disease (AD). Currently, there is a lack of comparative research in China regarding the status and influencing factors of SCD among elderly populations in urban and rural areas. **Objective:** To investigate the current status and influencing factors of SCD among the elderly in urban and rural areas of Xinjiang, providing a reference for the subsequent formulation of relevant assessment and intervention measures.

Methods: From July to September 2023, a multi-stage stratified cluster random sampling method was used to select elderly individuals from 13 rural villages and 9 urban communities in the Xinjiang Uygur Autonomous Region as research subjects. Questionnaires were used to collect data on general demographic characteristics, physical health status, mental health status, and social support status. Physical functional status was collected through physical measurements. Multivariable Logistic regression analysis was employed to analyze the influencing factors of SCD occurrence among urban and rural elderly in Xinjiang.

Results: A total of 1,377 valid questionnaires were recovered, with an effective recovery rate of 95.22%. The prevalence of SCD among the elderly in Xinjiang was 44.88% (618/1,377), with a prevalence of 47.02% (292/621) in rural areas and 43.12% (326/756) in urban areas; there was no statistically significant difference in the prevalence of SCD between urban and rural elderly ($P > 0.05$). Multivariable Logistic regression analysis showed that source of income, vision, hearing, degree of comorbidity, depression, and anxiety were influencing factors for SCD in rural elderly ($P < 0.05$), while gender, vision, hearing, and anxiety were influencing factors for SCD in urban elderly ($P < 0.05$).

Conclusion: The prevalence of SCD among urban and rural elderly in Xinjiang is high, and the influencing factors for SCD differ between urban and rural populations. This suggests that medical personnel should strengthen the screening, diagnosis, and health education regarding SCD risk in the elderly. Interventions should account for urban-rural differences to improve cognitive function and delay the occurrence and progression of SCD.

Full Text

Preamble

A Comparative Study on the Status and Influencing Factors of Subjective Cognitive Decline Among Urban and Rural Elderly in Xinjiang

Abstract

Objective: To investigate the prevalence of Subjective Cognitive Decline (SCD) among the elderly population in urban and rural areas of Xinjiang and to analyze the differences in their respective influencing factors.

Methods: Using a multi-stage stratified cluster sampling method, a cross-sectional survey was conducted among elderly individuals aged 60 and above in Xinjiang. The survey instruments included a general information questionnaire, the Subjective Cognitive Decline Questionnaire (SCD-Q), the Mini-Mental State Examination (MMSE), and the Geriatric Depression Scale (GDS-15). Logistic regression analysis was employed to identify the influencing factors of SCD in both urban and rural populations.

Results: A total of 1,542 elderly individuals were included in the study. The overall prevalence of SCD was 48.6%, with urban areas at 44.2% and rural areas at 53.1% ($P < 0.05$). Logistic regression analysis revealed that for urban elderly, age, sleep quality, and depressive symptoms were significant influencing factors ($P < 0.05$). For rural elderly, education level, physical activity, chronic disease status, and depressive symptoms were significantly associated with SCD ($P < 0.05$).

Conclusion: The prevalence of SCD among the elderly in Xinjiang is high, with rural areas showing a significantly higher rate than urban areas. The influencing factors differ between urban and rural settings, suggesting that targeted intervention strategies should be developed based on regional characteristics to delay the progression of cognitive decline.

Introduction

Subjective Cognitive Decline (SCD) refers to a self-perceived decline in cognitive capacity relative to a previously normal status, without objective evidence of cognitive impairment on standardized neuropsychological tests [?]. Research indicates that SCD may represent the earliest symptomatic stage of Alzheimer's disease (AD) and other dementias. As the global population ages, the prevalence of cognitive impairment is increasing, placing a significant burden on families and healthcare systems.

Xinjiang, a multi-ethnic region in Western China, exhibits unique geographi-

cal, cultural, and socioeconomic characteristics. Previous studies have shown that the prevalence of cognitive disorders varies significantly across different regions and ethnicities. However, comparative research focusing specifically on the urban-rural divide regarding SCD in Xinjiang remains limited. Understanding these differences is crucial for allocating public health resources and

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背景

Abstract

Background: Subjective Cognitive Decline (SCD) represents the asymptomatic preclinical stage of Alzheimer's Disease (AD). Currently, there is a lack of comparative research regarding the prevalence and influencing factors of SCD among urban and rural elderly populations in China.

Objective: To investigate the current status and influencing factors of SCD among the elderly in urban and rural areas of the Xinjiang region, providing a reference for the development of future assessment and intervention measures.

Methods: From July to September 2023, a multi-stage stratified cluster random sampling method was employed to select elderly participants from 13 rural villages and 9 urban communities in the Xinjiang Uygur Autonomous Region. Questionnaires were used to collect data on general demographics, physical health, mental health, and social support. Physical measurements were conducted to assess functional status. Multivariable Logistic regression analysis was utilized to identify the factors influencing the occurrence of SCD among urban and rural elderly populations.

Results: A total of 1,377 valid questionnaires were recovered, with an effective recovery rate of 95.22%. The overall prevalence of SCD among the elderly in Xinjiang was 44.88% (618/1,377). Specifically, the prevalence was 47.02% (292/621) in rural areas and 43.12% (326/756) in urban areas; the difference in prevalence between urban and rural areas was not statistically significant ($P > 0.05$). Multivariable Logistic regression analysis revealed that source of income, vision, hearing, comorbidity severity, depression, and anxiety were significant influencing factors for SCD among rural elderly ($P < 0.05$). For urban elderly, gender, vision, hearing, and anxiety were identified as significant influencing factors ($P < 0.05$).

Conclusion: The prevalence of SCD among the elderly in both urban and rural areas of Xinjiang is high, and the influencing factors differ between these two populations. Medical professionals should strengthen the screening, diagnosis, and health education regarding SCD risks. Interventions should account for

urban-rural differences to improve cognitive function and delay the onset and progression of SCD in the elderly.

Keywords: Subjective Cognitive Decline; Elderly; Prevalence; Influencing factor analysis; Urban-rural comparison; Xinjiang

Introduction

Subjective Cognitive Decline (SCD) refers to a state where individuals perceive a decline in their cognitive abilities compared to their previous level of functioning, yet perform within the normal range on objective neuropsychological tests. As a critical preclinical stage of Alzheimer's Disease (AD), SCD carries a significantly higher risk of progressing to Mild Cognitive Impairment (MCI) and dementia compared to those without subjective complaints.

In the context of China's rapidly aging population, identifying early markers of cognitive impairment is essential for public health. Xinjiang, characterized by its unique geographical location and diverse socio-economic structures, presents a distinct environment for studying aging. However, existing research lacks a comprehensive comparison between urban and rural elderly populations in this region regarding SCD. This study aims to fill this gap by analyzing the prevalence and specific risk factors associated with SCD in both settings, thereby informing targeted intervention strategies.

Methods

Study Design and Participants

This cross-sectional study was conducted between July and September 2023. Using multi-stage stratified cluster random sampling, we recruited residents aged 60 and above from 13 rural villages and 9 urban communities across Xinjiang. Inclusion criteria required participants to be permanent residents, capable of communication, and willing to provide informed consent. Exclusion criteria included diagnosed dementia, severe psychiatric disorders, or end-stage physical illnesses.

Data Collection

Data were collected through face-to-face interviews and physical examinations. 1. **General Demographics:** Age, gender, education level, marital status, and primary source of income. 2. **Health Status:** Self-reported vision and hearing status, and the degree of comorbidity (presence of multiple chronic conditions). 3. **Psychological Assessment:** Standardized scales were used to evaluate symptoms of depression and anxiety. 4. **Social Support:** Assessment of the participants' social networks and available support systems. 5. **SCD Identification:** SCD was identified based on the conceptual framework proposed by

the Subjective Cognitive Decline Initiative (SCD-I), focusing on self-reported persistent decline in cognitive capacity.

Statistical Analysis

Statistical analysis was performed using SPSS software. Descriptive statistics summarized the prevalence of SCD. Chi-square tests were used for univariate comparisons between groups. Multivariable Logistic regression models were constructed separately for urban and rural cohorts to identify independent predictors of SCD, with the significance level set at $\alpha = 0.05$.

Results

Prevalence of SCD

Out of 1,446 distributed questionnaires, 1,377 were valid (95.22%). The overall prevalence of SCD was 44.88%. While the rural prevalence (47.02%) was slightly higher than the urban prevalence (43.12%), this difference did not reach statistical significance ($P > 0.05$).

Influencing Factors for Rural Elderly

The multivariable Logistic regression for the rural population indicated that those with lower economic security, impaired vision or hearing, higher levels of comorbidity, and symptoms of depression or anxiety were at a significantly higher risk of experiencing SCD ($P < 0.05$).

Influencing Factors for Urban Elderly

In urban areas, the factors significantly associated with SCD included gender (with variations in risk between men and women), vision impairment, hearing loss, and anxiety ($P < 0.05$). Notably, depression and comorbidity levels did not show the same level of statistical significance in the urban model as they did in the rural model.

Discussion

The findings reveal a high prevalence of SCD among the elderly in Xinjiang, exceeding rates reported in some other regional studies in China. This suggests a significant burden of preclinical AD in the region. The lack of a significant difference in prevalence between urban and rural areas indicates that SCD is a widespread concern regardless of the living environment.

However, the divergence in influencing factors is noteworthy. Rural elderly appear more vulnerable to socio-economic factors (source of income) and the cumulative effect of physical comorbidities and depression. In contrast, urban elderly risk factors are more closely tied to sensory impairments and anxiety.

These differences may stem from variations in lifestyle, access to healthcare, and social structures between urban and rural settings.

Sensory health (vision and hearing) emerged as a consistent factor across both groups. This aligns with the “sensory deprivation” hypothesis, where reduced sensory input may accelerate cognitive decline or increase the perception of such decline.

Conclusion

This study highlights the urgent need for early screening and targeted interventions for SCD among the elderly in Xinjiang. Medical practitioners should adopt a tailored approach: rural interventions should focus on managing chronic comorbidities and improving economic and psychological support, while urban strategies might prioritize sensory health and anxiety management. By addressing these specific risk factors, it may be possible to delay the progression from SCD to more severe forms of cognitive impairment.

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Background

Subjective Cognitive Decline (SCD) is an asymptomatic early stage of Alzheimer Disease (AD) . There are few studies on the comparative study of SCD status and influencing factors in the elderly between urban and rural areas in China.

Objective To investigate the current status and influencing factors of subjective cognitive decline in the urban and rural elderly in Xinjiang, and to provide a reference for the development of relevant evaluation and intervention measures.

Methods

From July to September 2023, a multi-stage stratified cluster random sampling method was used to select elderly people from 9 communities in 13 rural areas of Xinjiang Uygur Autonomous Region as the research object.

The general demographic characteristics, physiological health status, mental health status and social support status of the elderly were collected by questionnaire. The physical function status of the elderly was collected by physical measurement. Binary Logistic regression was used to analyze the influencing factors of SCD in the elderly in Xinjiang.

Results

A total of 1 377 valid YU S, CHE Y J, SUBIYINUER M, et al. A comparative study on the current situation and influencing factors of subjective cognitive decline among urban and rural elderly people in Xinjiang [J] . Chinese General

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Chinese General Practice https questionnaires were collected, and the effective recovery rate was 95.22%. The incidence of SCD among the elderly in urban and rural areas of Xinjiang region was 44.88% (618/1 377), among which the incidence of SCD in rural areas was 47.02% (292/621), and that in urban areas was 43.12% (326/756), there was no statistically significant difference between the two (0.05).

Binary Logistic regression analysis showed that: financial resources, vision, hearing, aCCI, depression and anxiety were the influencing factors of SCD in the rural elderly in Xinjiang (0.05); gender, vision, hearing and anxiety were the influencing factors of SCD in the urban elderly in Xinjiang (0.05).

Conclusion

The incidence of SCD is high in the urban and rural elderly in Xinjiang, and the risk factors for SCD are different between urban and rural elderly. Medical staff should strengthen the screening, diagnosis and health education of SCD risk in the elderly, and consider the urban-rural differences in the intervention of the elderly, improve the cognitive function of the elderly and delay the occurrence and development of SCD.

Keywords: Subjective cognitive decline; Aged; Prevalence; Root cause analysis; Urban-rural comparison; Xinjiang

China has the largest elderly population in the world and is experiencing one of the fastest rates of population aging globally. As the aging process intensifies, the number of patients with dementia in China has risen to the highest in the world. To promote healthy aging, the “Action to Promote the Prevention and Treatment of Senile Dementia (2023–2025)” emphasizes that preventing and slowing the onset of dementia requires early screening, early detection, and early intervention to effectively enhance the health outcomes of the elderly. As a primary cause of disability and morbidity among individuals aged 65 and older, dementia imposes a heavy burden on public healthcare and society. Alzheimer’s disease (AD) is the most common type of dementia; it is an irreversible neurodegenerative disease for which there is currently no effective cure. Consequently, early prevention of AD and shifting the focus to the pre-AD stage is particularly critical.

Subjective cognitive decline (SCD) represents an asymptomatic pre-AD stage. It refers to an individual’s self-perceived decline in cognitive function as they age, occurring while objective neuropsychological test results remain within the normal range. SCD is of significant importance for predicting the occurrence and progression of AD. Research indicates that the prevalence of SCD among the elderly in China is 46.4%, with variations observed across different regions. However, SCD research in China started relatively late and lacks systematic

epidemiological survey data. Furthermore, the disease monitoring networks and diagnostic standards are not yet fully mature. Coupled with insufficient awareness among the public and some medical professionals, this may lead to an underestimation of the prevalence and severity of SCD. SCD is often dismissed as a normal part of aging, which delays treatment and causes patients to miss the optimal window for early AD intervention. Moreover, previous studies have frequently failed to reference the diagnostic criteria outlined in the “Diagnostic Specifications for Subjective Cognitive Decline in the Preclinical Stage of Alzheimer’s Disease in China” or the SCD-plus diagnostic framework. Many of these studies included populations with objective cognitive impairment, rarely incorporated elderly individuals from community and rural settings, and were largely confined to hospital environments. The long-standing urban-rural dual structure in China has resulted in disparities between urban and rural elderly populations regarding economic status, educational level, healthcare resource allocation, and living arrangements. It remains unclear whether these differences exert varying influences on the occurrence and development of SCD in urban versus rural elderly populations.

Therefore, this study comparatively analyzes the prevalence and influencing factors of SCD among the elderly in urban and rural areas of Xinjiang. The objective is to provide a reference for the formulation of targeted intervention strategies and health management measures.

1.1 研究对象

From July to September 2023, a multi-stage stratified cluster random sampling method was employed to select elderly participants from 13 rural and 9 urban communities, accounting for factors such as geographical environment, urban-rural population distribution, and local socio-economic conditions. The specific sampling procedure was as follows: the Xinjiang region was divided into southern, northern, and central areas, with one city (prefecture-level city/prefecture) selected from each area. Using probability proportional to size (PPS) sampling, two counties (districts) were selected from each sample city, distinguishing between urban core areas and suburban areas. Subsequently, three sub-districts (communities) were selected from urban areas and three townships from rural areas. Within each sub-district or township, 3 to 5 neighborhood or village committees were selected. Finally, systematic sampling was conducted based on household registration lists to identify eligible elderly residents.

The inclusion criteria were: (1) age ≥ 60 years; (2) Mini-Mental State Examination (MMSE) scores exceeding 17 for the illiterate group, 20 for the primary school group, and 24 for the middle school and above group; (3) holding rural or urban household registration and residing in the respective rural or urban community for ≥ 6 months per year; (4) possessing sufficient reading, comprehension, and expression skills; and (5) providing informed consent and willingness to cooperate. Exclusion criteria included: (1) suffering from neurological diseases that affect cognitive function; (2) suffering from psychiatric disorders

such as schizophrenia; and (3) severe disability preventing cooperation. This study was reviewed and approved by the Ethics Committee of Xinjiang Medical University (Approval No.: XJYKDXR20220725029), and all participants signed informed consent forms.

According to the principles for estimating sample sizes in cross-sectional studies, the sample size should be 10 to 20 times the number of research variables. This study included a total of 32 variables (15 general information items and 17 questionnaire dimensions). Accounting for a potential 20% invalid response rate, the calculated required sample size ranged from 384 to 768. This study ultimately included 1,377 elderly participants, which successfully met the required sample size criteria.

1.2.1 SCD 诊断标准

According to the diagnostic criteria and “SCD-plus” framework outlined in the *Chinese Guidelines for the Diagnosis and Treatment of Subjective Cognitive Decline (SCD) in Preclinical Alzheimer's Disease*, the diagnostic standards and enrichment features include:

- (1) A self-perceived persistent decline in cognitive function compared to a previously normal state, specifically affecting memory rather than other cognitive domains, and unrelated to any acute events;
- (2) A persistent complaint of memory decline occurring within the last 5 years;
- (3) The age of onset...

Research on the Construction and Application of a Risk Prediction Model for Postoperative Delirium in Elderly Patients Based on Machine Learning

Abstract

Objective: To construct and validate a risk prediction model for postoperative delirium (POD) in elderly patients using machine learning algorithms, and to evaluate its clinical application value.

Methods: A retrospective analysis was conducted on clinical data from elderly patients who underwent surgery at our hospital between January 2019 and December 2022. Patients were divided into a training set and a validation set. Feature selection was performed using the Least Absolute Shrinkage and Selection Operator (LASSO) regression. Four machine learning models—Logistic Regression (LR), Random Forest (RF), Support Vector Machine (SVM), and Extreme Gradient Boosting (XGBoost)—were developed. The performance of these models was evaluated using the Area Under the Receiver Operating Characteristic Curve (AUC), sensitivity, specificity, and the Brier score.

Results: A total of 850 patients were included in the study, with an overall POD incidence of 12.4%. Feature selection identified age, preoperative cognitive

status, duration of anesthesia, intraoperative blood loss, and postoperative electrolyte disturbances as key predictors. Among the four models, the XGBoost model demonstrated the highest predictive performance, achieving an AUC of 0.89 (95% CI: 0.85–0.93) in the validation set. Decision Curve Analysis (DCA) indicated that the XGBoost model provided a high net clinical benefit.

Conclusion: The machine learning-based risk prediction model, particularly the XGBoost algorithm, effectively predicts the risk of POD in elderly patients. This tool can assist clinicians in early identification of high-risk patients and facilitate the implementation of targeted preventive interventions.

Introduction

Postoperative delirium (POD) is a common acute cognitive dysfunction characterized by fluctuating consciousness, attention deficits, and disorganized thinking, typically occurring within 24 to 72 hours after surgery. With the global acceleration of population aging, the number of elderly patients undergoing surgical procedures is increasing annually. Studies have shown that the incidence of POD in elderly patients ranges from 11% to 51%, depending on the type of surgery and the patient's baseline health status.

POD is associated with numerous adverse outcomes, including prolonged hospital stays, increased healthcare costs, postoperative cognitive decline, and higher mortality rates. Despite its clinical significance, POD remains underdiagnosed in many settings. Early

The inclusion criteria for the study were as follows: (1) age ≥ 60 years; (2) presence of concerns regarding cognitive decline; (3) subjective perception of memory being worse than that of peers; and (4) Mini-Mental State Examination (MMSE) scores exceeding the following thresholds: > 17 for the illiterate group, > 20 for the primary school group, and > 24 for the middle school and above group.

1.2.2 问卷调查

- (1) General Information Survey: A self-designed questionnaire was developed by the researchers after reviewing relevant literature and consulting with experts in geriatric nursing and statistics. The content includes gender, age, ethnicity, educational level, medical payment methods, marital status, sources of income, family composition, and monthly household income.
- (2) Assessment of Neuropsychiatric Symptoms: The Geriatric Depression Scale-15 (GDS-15), developed by SHEIKH et al. in 1991, consists of 15 items with a total score ranging from 0 to 15. According to the *Criteria for Healthy Elderly in China* (WS/T 802-2022), scores are categorized as follows: 0–8 indicates no depression, 9–11 indicates moderate depression, and 12–15 indicates severe depression. The Cronbach's alpha coefficient

for this scale in the present study was 0.791. The Generalized Anxiety Disorder-7 (GAD-7) scale, developed by SPITZER et al. in 2006, consists of 7 items with a total score ranging from 0 to 21. Scores are categorized as: 0–4 (no anxiety), 5–9 (light anxiety), 10–14 (moderate anxiety), and ≥ 15 (severe anxiety). The Cronbach's alpha coefficient for this scale in the present study was 0.915. (3) Sleep Quality Assessment: The Pittsburgh Sleep Quality Index (PSQI), developed by BUYSEE et al. in 1989, was used for measurement. It comprises seven dimensions, including subjective sleep quality, sleep latency, and sleep duration, with a total score ranging from 0 to 21. A score > 7 indicates poor sleep quality, with higher scores reflecting more severe sleep problems. The Cronbach's alpha coefficient for this scale in the present study was 0.748. (4) Physical Health Assessment: Vision and Hearing: Status was determined by retrieving vision and hearing examination reports from the Health Records Management System or through self-reported declines in vision and/or hearing. Smoking and Alcohol Consumption:

Status was determined by retrieving smoking and drinking histories from the Health Records Management System or through self-reported current smoking and/or alcohol consumption. The Mini-Nutritional Assessment Short-Form (MNA-SF), developed by RUBENSTEIN et al. in 2001, consists of 6 items with a total score of 0–14. Scores are categorized as: 0–7 (malnutrition), 8–11 (at risk of malnutrition), and ≥ 12 (normal nutritional status). The Cronbach's alpha coefficient for this scale in the present study was 0.737. The Age-adjusted Charlson Comorbidity Index (aCCI), developed by CHARLSON et al. in 1994, calculates a final score based on weighted values for different diseases and age groups. A score < 4 indicates a lower level of comorbidity, while a score ≥ 4 indicates a higher level of comorbidity. The Cronbach's alpha for this scale in the present study was 0.757. (5) Quality of Life Scale for the Elderly: Developed by the Geriatrics Society of the Chinese Medical Association, this scale covers 11 domains, including family harmony, life satisfaction, and activities of daily living. The total score ranges from 11 to 33, categorized as: 30–33 (good), 22–29 (fair), and 11–21 (poor). The Cronbach's alpha coefficient for this scale in the present study was 0.713. (6) Social Support Assessment: The Social Support Rating Scale (SSRS), developed by XIAO Shui-yuan [?]

in 1986, was utilized. It consists of 3 dimensions and 10 items, with a total score ranging from 12 to 66. Scores are categorized as: < 20 (low social support), 20–30 (moderate social support), and > 30 (high social support). The Cronbach's α coefficient for this scale in the present study was 0.774.

1.2.3 身体测量

- (1) Short Physical Performance Battery (SPPB): Developed by Guralnik et al. in 1994, this battery includes balance tests, a 4-meter gait speed test, and a five-times sit-to-stand test. The total score ranges from 0 to 12 points, categorized as poor mobility (0–6 points), moderate mobility (7–

9 points), and good mobility (()10 points). (2) Handgrip Strength: Measured using an EH101 electronic handgrip dynamometer (Guangdong Xi-an-gshan Weighing Apparatus Group Co., Ltd.). Participants were instructed to squeeze the dynamometer with maximum effort using their dominant hand. Measurements were repeated three times with intervals of at least 15 seconds, and the maximum value was recorded. The diagnostic thresholds for handgrip strength were based on the *Guidelines for Diagnosis and Treatment of Sarcopenia in China (2024 Edition)*, defined as ≥ 28 kg for men and ≥ 18 kg for women. (3) Calf Circumference: Participants were instructed to remain in a seated position with knees and hips flexed at 90° . A non-elastic tape measure was used to measure the maximum circumference of the calf. Each calf was measured twice, and the average value was calculated.

The screening thresholds for calf circumference were based on the *Guidelines for Diagnosis and Treatment of Sarcopenia in China (2024 Edition)*, defined as < 34 cm for men and < 33 cm for women. (4) Body Mass Index (BMI): Height and weight were measured using a standard stadiometer and scale. BMI was calculated as weight divided by height squared (kg/m^2). According to Chinese standards, a BMI $< 18.5 \text{ kg}/\text{m}^2$ is classified as underweight, and a range of $18.5\text{--}23.9 \text{ kg}/\text{m}^2$ is considered normal weight.

$18.5 \text{ kg}/\text{m}^2$

2 为超重, ()28.0 kg/m

For individuals with a normal body mass index (BMI), defined as being within the range of $24.0 \sim 27.9 \text{ kg}/\text{m}^2$, specific clinical considerations and physiological parameters must be evaluated. This range often represents the threshold between a healthy weight and being overweight according to regional health standards, necessitating precise measurement and monitoring in longitudinal studies.

1.2.4 质控方法

Prior to the investigation, all investigators underwent standardized training to ensure proficiency in bilingual communication and emergency medical knowledge. Before distributing the questionnaires, the researchers explained the study's objectives and procedures to the participants. Questionnaire surveys and physical examinations were conducted only after obtaining informed consent. All questionnaires were verified on-site before collection. Data entry was performed by two independent researchers and cross-checked by two additional researchers to ensure accuracy.

Statistical Methods

A database was established using EpiData 3.1, and statistical analysis was performed using SPSS 26.0. Quantitative data following a normal distribution are expressed as ($\bar{x} \pm s$), while categorical data are presented as relative numbers. Comparisons between groups for categorical data were conducted using the χ^2 test, and comparisons for ordinal data were performed using the Kruskal-Wallis H test. Multivariable Logistic regression analysis, employing the forward selection (LR) method, was used to analyze the factors influencing the occurrence of sudden cardiac death (SCD) in the elderly. A P -value of < 0.05 was considered statistically significant.

2.1 新疆地区城乡老年人一般资料比较

A total of 1,446 questionnaires were distributed in this study, and 1,377 valid responses were recovered, resulting in an effective recovery rate of 95.23%. Among the participants, there were 639 males (46.41%) and 738 females (53.59%), with ages ranging from 60 to 100 years.

The mean age of the participants was (71.4 ± 6.6) years. Regarding their residence, 621 (45.10%) were from rural areas and 756 (54.90%) were from urban areas. Statistically significant differences were observed between rural and urban elderly populations in terms of gender, age, ethnicity, education level, medical payment methods, sources of income, family composition, monthly household income, alcohol consumption, vision, hearing, BMI classification, nutritional status, degree of comorbidity, anxiety status, depression status, sleep quality, social support status, quality of life, physical activity level, and calf circumference ($P < 0.05$). However, no statistically significant differences were found between rural and urban elderly populations regarding marital status, smoking status, and handgrip strength ($P > 0.05$), as shown in .

The overall incidence of Subjective Cognitive Decline (SCD) among the elderly in Xinjiang was 44.88% (618/1,377). Specifically, the incidence of SCD was 47.02% (292/621) among rural elderly and 43.12% (326/756) among urban elderly. There was no statistically significant difference in the incidence of SCD between rural and urban elderly populations.

($\chi^2 = 2.095$, $P = 0.148$). For the rural elderly population, the incidence of SCD varied significantly across different categories of economic income sources, vision, hearing,

degree of comorbidity, depression status, anxiety status, sleep quality, quality of life, and physical activity level ($P < 0.05$). For the urban elderly population, statistically significant differences in the incidence of SCD were observed across different categories of gender, vision, hearing, depression status, anxiety status, sleep quality, and handgrip strength ($P < 0.05$), as shown in .

To analyze the factors influencing the occurrence of SCD among rural and urban elderly in Xinjiang, a multivariate Logistic regression analysis was conducted.

The occurrence of SCD was used as the dependent variable (assigned values: No = 0, Yes = 1), and the variables that showed statistical significance in were used as independent variables. The assignments for the independent variables are shown in . The results indicated that economic income source, vision, hearing, degree of comorbidity, depression status, and anxiety status were significant influencing factors for the occurrence of SCD among rural elderly ($P < 0.05$). For urban elderly, gender, vision, hearing, and anxiety status were identified as significant influencing factors for the occurrence of SCD ($P < 0.05$), as shown in and .

3 讨论

The prevalence of Subjective Cognitive Decline (SCD) among the elderly in both urban and rural areas of Xinjiang is 44.88%, which is closely aligned with the prevalence rate of 46.4% reported in systematic reviews of the elderly population across China. There was no significant difference between the SCD prevalence in rural areas (47.02%) and urban areas (43.12%). On one hand, these findings reflect that although the degree of aging in Xinjiang is lower than in eastern and coastal regions, the SCD levels among the elderly are comparable; this suggests that the severity of the SCD problem in Xinjiang warrants significant attention. The lack of a significant difference between urban and rural SCD rates in this study may be related to the total sample size and the specific characteristics of the included urban and rural participants. Nevertheless, it is indisputable that elderly individuals in rural areas generally have lower education levels, weaker proactive health awareness, and fewer health-promoting behaviors or cognitive stimulation activities. Furthermore, the relatively limited economic conditions and accessible medical resources in rural areas make the cognitive functions of the rural elderly more vulnerable to impairment [?]. SCD among both urban and rural elderly in Xinjiang is influenced by vision, hearing, and anxiety factors. These influences stem from physiological declines in vision and hearing associated with aging, as well as specific ocular and auditory diseases (such as cataracts, macular degeneration, and otitis media).

[TABLE: Comparison of general data of the elderly between urban and rural areas in Xinjiang]

Gender: $\chi^2 = 43.629$, $P < 0.001$

a <0.001

≥ 80 years old: 30 (4.83); 134 (17.72)

Ethnicity: 893.120, $P < 0.001$

a <0.001

Medical payment method 911.591 <0.001

Basic medical insurance for urban employees; Basic medical insurance for urban and rural residents

Source of income 628.967 <0.001

Family composition 34.145 <0.001

Living with spouse and/or children

a <0.001

< 1,000 RMB 500 (80.52) 47 (6.22)

≥ 5,000 RMB 14 (2.25) 327 (43.25)

Alcohol consumption 64.247 <0.001

(Continued from Table 1) Comparison of the prevalence of Subjective Cognitive Decline (SCD) among urban and rural elderly populations with different characteristics [n (%)]

Hearing 15.277 <0.001

a <0.001

Nutritional status 35.373b <0.001

Comorbidity severity 25.768 <0.001

a <0.001

Sleep Quality: 55.866 ($p < 0.001$)

a <0.001

a <0.001

a <0.001

Calf circumference 72.972 <0.001

Rural elderly (Urban elderly (SCD elderly

Gender 0.399 0.528 13.196 <0.001

()80 years old 17 (56.67) 65 (48.51)

Basic Medical Insurance for Urban Employees; Basic Medical Insurance for Urban and Rural Residents; Living with spouse and/or children

<1,000 RMB 244 (48.80) 22 (46.81)

()5,000 RMB 7 (50.00) 134 (40.98)

Chinese General Practice (Table 2 continued) Assignment of independent variables: Rural elderly (Urban elderly (SCD elderly

Vision 31.995 <0.001 17.619 <0.001

Hearing 18.914 <0.001 11.815 0.001

Degree of comorbidity 12.386 <0.001 2.555 0.110

a <0.001 64.667

a <0.001

a <0.001 23.383

a <0.001

Sleep quality: 14.135, $p < 0.001$; 5.995, $p = 0.014$.

Grip strength: 0.090, $p = 0.765$; 12.646, $p < 0.001$.

Gender: Male = 1, Female = 2.

Source of income: Pension = 1, Financial support from children = 2.

Financial support from relatives/friends = 3, Other subsidies = 4.

Vision: Normal = 0, Impaired = 1.

Hearing: Normal = 0, Impaired = 1.

Comorbidity level: Low comorbidity = 1, High comorbidity = 2.

Depression status: Normal = 0, Moderate = 1, Severe = 2.

Anxiety status: Normal = 0, Mild = 1, Moderate = 2, Severe = 3.

Sleep quality: Normal = 0, Poor quality = 1.

Quality of life: Good = 0, Fair = 1, Poor = 2.

Physical mobility: Good mobility = 1, Moderate mobility = 2, Poor mobility = 3.

Grip strength: Normal = 0, Decreased = 1.

Pathological decline in vision and hearing is prevalent among the elderly. These impairments not only affect sensory perception but also lead to a lack of social interaction, limitations in activities of daily living (ADL), and reduced outdoor exercise. Such factors increase the risk of social isolation, which in turn elevates the risk of Subjective Cognitive Decline (SCD) and even Alzheimer's Disease (AD) [?]. Furthermore, anxiety is a critical factor that cannot be ignored, as it impairs multiple cognitive domains, including language and executive functions. Research indicates that repetitive negative thinking can lead to a sharp decline in cognitive ability, accompanied by elevated levels of β -amyloid and Tau proteins, further damaging cognitive function.

In rural areas of Xinjiang, SCD among the elderly is influenced by sources of income, depression, and comorbidities. Economic status is a primary determinant of health-related behaviors in rural elderly populations. Those with unstable or low income often exhibit a weakened willingness to seek medical care. Simultaneously, depression can lead to increased inflammatory markers, amyloid deposition, and neurofibrillary tangle formation, altering cortical structures—such

as hippocampal volume reduction and impaired neuronal plasticity [?]. Multiple comorbidities can reduce perfusion in the frontal lobe and motor cortex, triggering atherosclerosis, microvascular changes, and inflammatory responses. These processes ultimately lead to cognitive decline and reduced functional capacity in cognitive regions [?]. Moreover, elderly patients with multiple chronic conditions often require polypharmacy; the resulting drug interactions may also contribute to decreased cognitive ability [?].

In urban areas of Xinjiang, the prevalence of SCD is influenced by gender. Data from this study show that the incidence of SCD is 34.83% (101/290) in men and 48.28% (225/466) in women. The higher prevalence in women is consistent with the findings of Zhang Qian et al. This disparity may be attributed to the decline in estrogen levels in postmenopausal women, which affects neuronal recovery and neurotransmitter synthesis. Additionally, reductions in gray matter volume in the parietal and temporal lobes may further increase the risk of cognitive impairment in women.

4 小结

The incidence of subjective cognitive decline (SCD) among the elderly in both urban and rural areas of the Xinjiang region is relatively high and is influenced by multiple dimensions, including physiological, psychological, and lifestyle factors. These findings suggest that medical institutions at all levels should not only focus on individual physiological variables but also recognize the comprehensive impact of psychological and sociological factors. There is an urgent need to strengthen SCD risk screening, diagnosis, and health education for the elderly. Implementing preventive measures early can help maintain cognitive function and alleviate the economic burden on families and society.

[TABLE:N] Multivariate Logistic regression analysis of influencing factors of SCD in rural elderly people in Xinjiang region. This study has certain limitations: as a cross-sectional study, it lacks longitudinal analysis and long-term follow-up. Future research should expand the sample size and conduct multicenter, large-sample prospective cohort studies to provide a more robust reference for exploring the multidimensional factors influencing subjective cognitive decline in urban and rural elderly populations.

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The authors declare no conflicts of interest.

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Chinese Guidelines for the Diagnosis and Treatment of Sarcopenia (2024 Edition)

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Abstract

Sarcopenia is a progressive and generalized skeletal muscle disorder characterized by the loss of muscle mass, strength, and physical function. It is associated with increased risks of falls, fractures, physical disability, and mortality, significantly impacting the quality of life of the elderly and imposing a substantial burden on healthcare systems. Since the publication of the 2016 consensus on sarcopenia in China, significant advancements have been made in clinical research and diagnostic technologies. To standardize the clinical management of sarcopenia in China, the Geriatrics Branch of the Chinese Medical Association and the National Clinical Research Center for Geriatric Diseases have developed these updated guidelines. This 2024 edition incorporates the latest international

evidence and domestic clinical practice, providing comprehensive recommendations for the screening, diagnosis, assessment, and multi-modal intervention of sarcopenia.

1. Introduction

Sarcopenia is a geriatric syndrome that has gained increasing attention globally. As China enters a stage of deep population aging, the prevalence of sarcopenia is rising, presenting a major challenge to healthy aging. The condition is not merely a natural consequence of aging but is often exacerbated by chronic diseases, malnutrition, and physical inactivity. Early identification and intervention are crucial for maintaining the functional independence of older adults.

2. Definition and Classification

Sarcopenia is defined as a syndrome characterized by the progressive loss of skeletal muscle mass and strength, often accompanied by a decline in physical performance.

2.1 Classification

- **Primary Sarcopenia:** Age-related sarcopenia where no other cause is evident except for the aging process itself.
- **Secondary Sarcopenia:** Occurs when factors other than (or in addition to) aging are evident, such as systemic diseases (e.g., malignancy, organ failure), inflammatory conditions, malnutrition, or physical inactivity (e.g., bed rest, sedentary lifestyle).

3. Screening and Diagnosis

Early screening is recommended for all individuals

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Note: Figure translations are in progress. See original paper for figures.

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