

ORIGINAL ARTICLE

Rural aging in Thailand: determinants and challenges of elderly health status in Phayao Province

Sittichai Saisom¹, Natnapa Promma^{2*}, Taweewun Srisookkum², Manuchet Manotham², Nattapon Pansakun², Pornpana Somjit², Somchai Namyu¹, Pamika Jumpukrua³

¹Mueangphayao Public Health Office, Phayao, Thailand

²School of Public Health, University of Phayao, Phayao, Thailand

³Ban Tam Sub-District Health Promoting Hospital, Phayao, Thailand

Corresponding Author: Natnapa Promma **Email:** natnapa.pr@up.ac.th

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ABSTRACT

Thailand is experiencing rapid population aging, with elderly citizens representing 20.36% of the total population. Phayao Province has an especially high proportion of elderly residents (26.54%), particularly in rural areas where healthcare access and support may be limited. This cross-sectional study aimed to assess health status and identify its determinants among rural elderly in Phayao Province. Using multi-stage cluster sampling, 453 participants aged ≥ 60 years were selected from three districts. Data were collected from May to July 2024 using validated questionnaires (Cronbach's alpha 0.701-0.974) covering health status, quality of life, mental health, family relationships, and activities of daily living (ADL). Results showed that 42.6% of participants had moderate health status, while 39.3% had poor health status. The majority were female (58.9%), with a mean age of 69.06 years. Bivariate analysis identified significant factors ($p < 0.05$) including employment status, income, income sufficiency, living arrangements, exercise, health information, mental health, quality of life, family relationships, and ADL. Stepwise Multiple Linear Regression revealed five significant predictors: family relationships ($\beta = 0.355$, $p < 0.001$), income sufficiency ($\beta = -3.328$, $p < 0.001$), exercise ($\beta = 5.640$, $p < 0.001$), ADL ($\beta = 0.511$, $p < 0.001$), and quality of life ($\beta = 0.120$, $p = 0.001$), explaining 30.9% of health status variance. These findings suggest the need for integrated interventions addressing both social and health dimensions. Recommendations include developing elderly employment programs, strengthening family support systems, promoting exercise programs, and enhancing community mental health services. Policy makers and healthcare providers should consider these factors when designing targeted interventions for rural elderly populations.

Keywords:

health status; rural elderly; family relationships; quality of life; Thailand

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INTRODUCTION

At present, the global population is experiencing slower growth, while the number and proportion of the elderly population are rising rapidly. In 2022, there were 1.109 billion elderly people worldwide, accounting for 14% of the global population. In Thailand, the overall population growth rate has declined, but the elderly population is increasing. The total population has decreased from 66 million to only 60 million, while the elderly population has grown from 13 million to 19 million.¹ Thai elderly citizens account for 20.36% of the total population.²

Changes in social, economic, political, and environmental conditions may lead to challenges in elderly care, affecting the quality of life and well-being of the elderly.³ The role of the family in promoting the quality of life of the elderly during times of change is also significant. The elderly experience various changes, including physical alterations that involve structural and functional changes in all body systems. Psychological changes often result from and are closely interconnected with physical and social changes. These changes can lead to health problems, difficulties in performing tasks and fulfilling roles, and a loss of authority, potentially resulting in stress and issues with both physical and mental health.⁴ Health status is a key indicator of the well-being of the elderly population. For elderly individuals to have a quality life, they must maintain good physical and mental health in addition to being financially stable.

However, in the context of Thailand, previous research studies have indicated that a longer life expectancy does not necessarily equate to better health. The majority of the elderly suffer from chronic conditions, with 38.2% having high blood pressure. Regarding their quality of life, 48.1% were found to be at a moderate level. When examining specific aspects, 45.0% reported a good quality of life in terms of

the environment, while the poorest quality of life was observed in the social relationships aspect, with 17.0%.⁵ Elderly individuals also face psychological or mental health issues, which stem from difficulties in adapting appropriately to people, society, and their environment.⁶ The ability of the elderly to care for themselves has a low negative correlation with age and the responsibility of caring for grandchildren.⁷

Northern Thailand has an elderly population of 23.74%, while Phayao Province, with a total population of 454,485 people, has 120,614 elderly individuals, accounting for 26.54%.² It is evident that Phayao Province has fully transitioned into an aging society. The behaviors related to the health conditions of elderly people in rural Phayao include smoking and alcohol consumption, which are influenced by social and economic factors.^{8,9} These behaviors are often associated with participation in community activities, where alcohol consumption occurs in social gatherings, such as local festivals or community events. In some areas, drinking alcohol has become part of the local culture, which may lead to an increase in alcohol-related behaviors among older adults.^{10,11} Additionally, psychological factors, such as social isolation, may increase the risk of both mental and physical health problems in this group of elderly people.¹² Based on the information, it demonstrates the preliminary characteristics of the health behaviors of the rural elderly.

In rural settings, access to healthcare is often limited due to constraints on resources and transportation.¹³ Therefore, support from family and community plays a crucial role in helping the elderly manage their health when access to medical services is inadequate. This study utilizes the Social-Ecological Model as the primary conceptual framework to analyze factors influencing the health and health behaviors of the elderly.¹⁴⁻¹⁶ This model emphasizes

that health outcomes are influenced by interconnected factors at multiple levels, including the individual, family, community, and broader social and policy levels. The study highlights the importance of integrating these factors to promote better health and quality of life for the rural elderly.¹⁷ The variables studied cover multiple levels including individual level factors such as age, gender, health status, ability to perform activities of daily living (ADL), exercise habits, health knowledge, and mental status, all of which directly impact the health of the elderly. Interpersonal level is support from family and close relationships, including care, assistance with daily activities, and emotional support, which affect the elderly's quality of life. Community level is community-related factors, such as social networks, community support, health infrastructure, and access to public health services. Participation in community activities can improve both the physical and mental health of the elderly. And societal and cultural level is perceptions of the role of the elderly in society, and social policies related to elderly care, which influence healthcare access.¹⁷ This multi-level analysis provides a comprehensive understanding of the factors affecting the health of the rural elderly and offers insights into approaches for improving their quality of life. However, there is a lack of research on the health status of the elderly in Phayao Province. Therefore, it is necessary to study the health status, including quality of life, mental health, and self-care abilities of the elderly. Additionally, it is important to assess the health status and examine the determinants of health among the rural elderly population in Phayao Province to provide data for planning by relevant agencies and to help educational institutions develop curricula that address the issues and needs of the elderly.

METHODS

Study design and population

This research was a cross-sectional study that collected data through a research interview form. The target population consisted of elderly individuals aged 60 years and older living in rural areas of Phayao Province, totaling 116,561 people. Data collection was conducted efficiently and accurately from May to July 2024 across three districts, with a total rural elderly population of 41,951 people.

Sample size and sampling procedure

The sample size was calculated using the formula developed by Daniel WW.¹⁸ The study defined the proportion of quality of life at a moderate level as 48.1%,⁵ leading to a suitable sample size of 453 individuals. We selected the sample using multi-stage cluster sampling. Phayao Province was divided into three zones: North, Central, and South. Districts were chosen as the sampling units and were randomly selected independently using simple random sampling, resulting in one district from each zone, totaling three sample districts. Next, sub-districts were chosen as the second sampling units. These were randomly selected independently using simple random sampling, resulting in 2–4 sub-districts per district, totaling 10 sample sub-districts. Subsequently, villages were randomly selected independently using simple random sampling, with five villages per sub-district, totaling 50 sample villages as the third sampling unit. Finally, Thai elderly individuals were selected as the ultimate sampling unit through a lottery draw, resulting in the inclusion of the three selected districts.

Inclusion Criteria:

1. The sample consisted of elderly individuals.
2. The sample had resided in Phayao Province for at least one year.

3. The sample understood Thai and was able to communicate and respond effectively.

4. The sample consented to and voluntarily participated in the research project by signing a written consent form.

Exclusion Criteria:

1. The sample could not complete the questionnaire or experienced difficulty providing information.

2. The sample was seriously ill and unable to provide information during the data collection period.

Measurement instruments

We developed the research interview form for collecting personal information based on a review of the literature and various research studies. The content scope is framed within the research conceptual framework, and a standardized research tool was used, divided into six sections as follows:

(1) General characteristics of participants (gender, marital status, education level, sufficiency of monthly income, occupation, healthcare coverage, availability of a caregiver during illness, chronic diseases or health conditions, and family structure) and health behaviors, including smoking, alcohol consumption, exercise, consumption of bland food, access to health information, and the use of herbal remedies.

(2) The quality-of-life assessment for the elderly used the World Health Organization's Quality of Life measurement tool, the abbreviated Thai version (WHOQOL-BREF-THAI)¹⁹ developed by the Department of Mental Health, Ministry of Public Health. It was divided into four components: 1) Physical health, 2) Psychological health, 3) Social relationships, and 4) Environment. There were 26 questions, each with five response options: Not at all = 1, Slightly = 2, Moderately = 3, A lot = 4, and Very much = 5. The quality of life was classified into three levels: Poor quality of life = 26–60

points, Moderate quality of life = 61–95 points, and Good quality of life = 96–130 points.

(3) The short version of the Thai Mental Health Indicator (TMHI-15)²⁰ developed by the Department of Mental Health, Ministry of Public Health was used, consisting of 15 positive and negative questions. The responses had four options: Not at all = 4, Slightly = 3, Moderately = 2, and Very much = 1. Mental health was categorized into three levels: Better mental health than the general population = 51–60 points, Equal mental health to the general population = 44–50 points, and Poorer mental health than the general population = less than 43 points.

(4) The Family Relationship Assessment developed by Suthisukon K, et al.,²¹ from the Department of Women's Affairs and Family Development consisted of four aspects: 1) Time spent on shared activities among family members, 2) Communication, consultation, and decision-making on important matters, 3) Expressions of love and care physically, verbally, and emotionally, and 4) Fulfilling appropriate roles and responsibilities of family members. There were 41 questions in total, with three response options: Never = 0, Sometimes = 1, and Regularly = 2. Family relationships were categorized into three levels: Poor family relationships (<P25), Moderate family relationships (P25–P75), and Good family relationships (>P75).

(5) The Barthel Index of Activities of Daily Living (ADL) assessment developed by Jitapunkul S, et al.²² consisted of 10 questions, with a total score of 20 points. The scoring was divided into four levels: Very low initial score, total dependence = 0–4 points; Low initial score, severe dependence = 5–8 points; Intermediate initial score, moderately severe dependence = 9–11 points; and Intermediate high, mildly severe dependence, consideration of discharging home = 12–20 points.

(6) The health status assessment was developed from a review of relevant literature and research documents. It was divided into aspects of exercise, nutrition, stress management, health responsibility, spirituality, and interpersonal interaction, consisting of 20 positive questions. The responses had four options: Never = 0, Occasionally = 1, Frequently = 2, and Regularly = 3. The self-rated health (SRH)²³ criteria were applied to categorize behaviors into three levels: Good health = 48–60 points, Moderate health = 36–47 points, and Poor health.

We conducted a quality check of the interview protocol in this study. This interview, consisting of a 30-sample group with characteristics similar to those of eligible participants of the main study, has been tested for content validity and reliability. Each part of the interview was accepted, with Cronbach's alpha ranging from 0.701 to 0.974.

Data collection

The ethics of this study complied with the Declaration of Helsinki. Approval and ethical clearance were obtained from the Human Research Ethics Committee, Phayao Provincial Public Health Office, with the assigned Institutional Review Board (IRB) approval reference number 039/ 2567. After the IRB approval, all participants were informed of the purposes of this survey study. We clarified the research objectives, explained the concepts, and described the roles in conducting the research in collaboration with officials from relevant agencies, including hospitals, Subdistrict Health Promoting Hospitals, and local administrative organizations in Phayao Province, including village healthcare volunteers (VHVs), to foster cooperation in data collection and serve as guides alongside the research team.

Data analysis

The statistical software was used to analyze the data, applying both descriptive statistics and inferential analyses, including bivariate analysis with Pearson's correlation at a significance level of 0.05. Before running the data analysis, the assumptions of multiple linear regression were tested for independence of errors, converting categorical independent variables into dummy variables, and checking for multicollinearity as indicated by tolerance and VIF (Variance Inflation Factor) checks, with tolerance values being high (close to 1) and VIF values not exceeding 10.²⁴ All assumptions were met. The stepwise multiple linear regression analyses on health status scores identified factors that were statistically significantly related at the significance level of 0.05, including employment status, income, income sufficiency, living arrangements, exercise, health information, mental health, quality of life, family relationships, and ADL.

RESULTS

This research study examined the general characteristics of elderly individuals in rural society. It found that the majority of the elderly were female (58.9%) with an average age of 69.06 years. Most had completed primary education (79.5%) and were married (63.6%). The primary occupation was agriculture (34.2%), with an average monthly income of 2,522.96 baht, where 74.6% earned less than 3,000 baht. Additionally, 55.2% reported that their income was insufficient, and 32.2% had a history of illness. Among the elderly, 65.8% had caregivers, and 73.3% lived in nuclear families. Most received government welfare benefits (85.4%) (Table 1).

Table 1 General characteristics of elderly in rural society (n=453)

Characteristics	Number	%
Gender		
Male	186	41.1
Female	267	58.9
Age	$\bar{x}=69.06$, $SD=6.526$, Min=60, Max=92	
60–70 Years	294	64.9
71–80 Years	133	29.4
≥ 81 Years	26	5.7
Education		
Uneducated	60	13.3
Primary Education	360	79.5
Secondary Education	25	5.5
Bachelor's Degree/Higher	8	1.7
Marital Status		
Married/Partnered	288	63.6
Single	21	4.6
Widowed/Divorced/Separated	144	31.8
Occupation		
Unemployed	210	46.4
Agriculture	155	34.2
Commerce	38	8.4
Labor	45	9.9
Other	5	1.1
Income (per month $\bar{x}=2,522.96$, $SD=2,131.995$, Min=600, Max=15,000)		
<3,000 Baht	338	74.6
3,001–5,000 Baht	79	17.4
≥5,001 Baht	36	8.0
Income Sufficiency		
Sufficient	203	44.8
Insufficient	250	55.2
Medical History		
Yes	146	32.2
No	307	67.8
Having a Caregiver		
Yes	298	65.8
No	155	34.2
Family Structure		
Nuclear Family	332	73.3
Extended Family	108	23.8
Living Alone	13	2.9
Healthcare Benefits		
Government Welfare Benefits	387	85.4
Other	66	14.6

The health status of the elderly in rural society showed that 18.1% were in good health, 42.6% were in moderate health, and 39.3% were in poor health. This

indicates that many elderly individuals had health statuses ranging from moderate to poor, which may require additional care and support in terms of health (Figure 1).

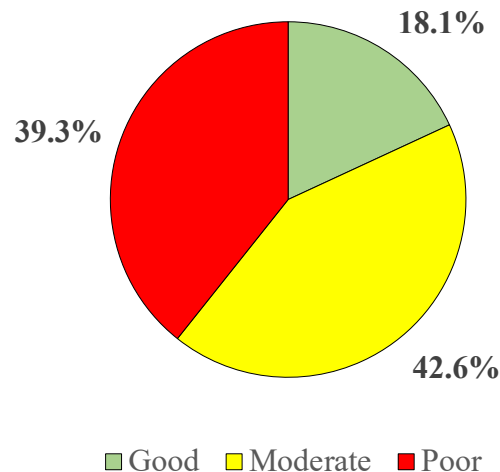


Figure 1 Health status level of the elderly in rural society (n=453)

The data on the health behaviors of the elderly in rural society indicated that the majority of the sample exhibited the following characteristics: 87.0% do not smoke, 63.8% do not consume alcohol,

89.0% do not exercise, 55.0% consume bland food, 96.6% do not have access to health information, and 81.7% do not use herbal remedies (Figure 2).

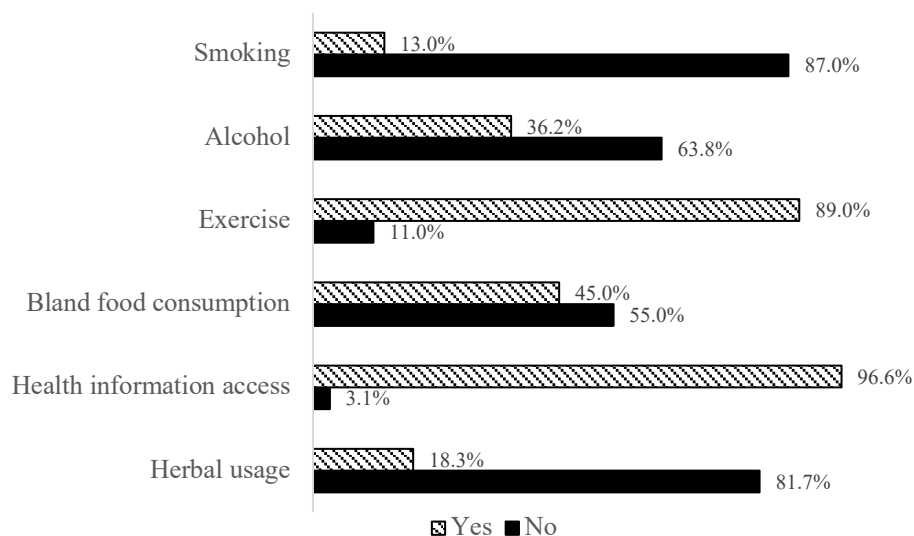


Figure 2 Healthy behavior of the elderly in rural society (n=453)

The results of the bivariate analysis using Pearson's correlation to assess the relationship between independent variables and the Health Status of the elderly in rural communities of Phayao Province found that variables such as Income, Income Sufficiency, Exercise, Mental Health,

Quality of Life, Family Relationships, and ADL had a significant positive correlation with the Health Status of the elderly, while Employment Status had a negative correlation with the Health Status of the elderly (Table 2).

Table 2 Bivariate analysis using Pearson's correlation to assess the relationship between independent variables and health status of the elderly in the rural society of Phayao Province (n=453)

Variables	1	2	3	4	5	6	7	8	9	10
1 Employment Status	1.000									
2 Income	-0.508**	1.000								
3 Income Sufficiency	0.473**	-0.520**	1.000							
4 Exercise	0.068	0.003	-0.051	1.000						
5 Health information	0.086	-0.085	0.052	0.200**	1.000					
6 Mental Health	-0.078	0.128**	-0.020	-0.065	-0.108*	1.000				
7 Quality of Life	-0.238**	0.268**	-0.185**	-0.147**	-0.174**	0.355**	1.000			
8 Family Relationships	-0.269**	0.275**	-0.336**	-0.109*	-0.208**	0.143**	0.263**	1.000		
9 ADL	-0.223**	0.132**	-0.075	-0.121*	-0.030	0.214**	0.207**	0.091	1.000	
10 Health Status	-0.250**	0.314**	-0.346**	0.125**	-0.093*	0.133**	0.268**	0.442**	0.199**	1.000

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

The results of the stepwise multiple linear regression analysis evaluated the relationships between various independent variables and health status. Each variable's coefficient (B) reflected its contribution to the prediction of health status, with positive values indicating a direct relationship and negative values indicating an inverse relationship. X_1 (Family Relationships) had a positive coefficient of 0.355, suggesting that stronger family relationships were associated with improved health status. This relationship was highly significant ($p < 0.001$). X_2 (Income Sufficiency) had a negative coefficient of -3.328, indicating that greater income sufficiency was linked to lower outcome scores, which was also significant ($p < 0.001$). X_3 (Exercise) had a positive coefficient of 5.640, showing that increased physical activity correlated with

better health status, with statistical significance ($p < 0.001$). X_4 (Activities of Daily Living) had a coefficient of 0.511, suggesting that better performance in daily activities positively affected health status, significant at $p < 0.001$. X_5 (Quality of Life) had a coefficient of 0.120, indicating a positive influence on health status, with significance ($p = 0.001$). The constant term was -12.935, representing the expected value of health status when all independent variables were zero. The model had an R^2 value of 0.309, indicating that approximately 30.9% of the variance in health status could be explained by the independent variables included in the analysis (Table 3). The health status prediction equation can be written as follows: $-12.935 + 0.355(X_1) - 3.328(X_2) + 5.640(X_3) + 0.511(X_4) + 0.120(X_5)$.

Table 3 Stepwise Multiple Linear Regression analysis showing factors predicted with health status of the elderly in rural society (n=453)

	Variables	B	SE	Beta	p-value	Tolerance	VIF
X ₁	Family Relationships	0.355	0.043	0.353	<0.001	0.836	1.196
X ₂	Income Sufficiency	-3.328	0.779	-0.180	<0.001	0.866	1.155
X ₃	Exercise	5.640	1.179	0.193	<0.001	0.953	1.049
X ₄	ADL	0.511	0.140	0.147	<0.001	0.946	1.057
X ₅	Quality of Life	0.120	0.036	0.140	0.001	0.876	1.141
Constant = -12.935, R ² =0.309							

DISCUSSION

The study found that older adults in rural areas had a moderate level of health (42. 61%), reflecting public health challenges in rural settings. These challenges may stem from limited access to healthcare services and medical resources, as well as inadequate health knowledge. Some older adults may not have been able to fully comply with medical advice. This finding aligns with previous research⁵ which reported that the majority of older adults had chronic illnesses such as hypertension (38. 2%) and a moderate quality of life (48. 1%). These results highlight the need to improve healthcare access and promote health literacy in rural communities.

Working in old age was shown to have a positive impact on health by providing both income and a sense of self-worth. Employment helped older adults feel socially engaged²⁵, reducing stress and depression. Research in South Korea²⁶ also found that older adults who continued working had better mental health and were less prone to depression due to their social involvement and recognition from family and community. Additionally, income and income sufficiency played a significant role in determining health status. Adequate income enabled older adults to access healthcare, nutritious food, and safe housing. A study in India²⁷ revealed that older adults with low income were at a

higher risk of health issues such as chronic diseases and malnutrition, while those with sufficient income managed their health better due to improved access to medical care and healthy behaviors.²⁸ This indicates that having a stable income is crucial for long-term health maintenance.

Living with a caregiver played a crucial role in providing both physical and emotional support. Having a caregiver helped older adults perform daily activities more effectively and reduced the risk of depression and mental health issues due to close supervision. This finding is consistent with research which indicated that older adults living with caregivers had fewer mental health problems and better self-care abilities compared to those living alone.²⁹ This emphasizes the importance of family support, as strong family relationships positively affect the health of older adults. The older adults in rural China who had close family relationships exhibited better mental and physical health.³⁰ Moreover, social support from family members contributed to improved physical and mental health.²⁹ However, family migration and financial limitations could pose challenges to providing consistent family support.

Promoting healthy behaviors, such as exercise and a balanced diet, was identified as a key factor in reducing the risk of chronic diseases, such as diabetes and hypertension, while also fostering good mental health. The study revealed that older

adults who exercised and adhered to healthy behaviors had better overall health.³¹ Further research showed that reducing smoking and alcohol consumption lowered the risk of cardiovascular diseases.³² Therefore, community support and education are essential for rural older adults, who often face barriers to accessing healthcare services.³³ As the elderly population in rural areas continues to grow, their quality of life is frequently impacted by economic, social, and environmental factors. These factors are critical for promoting the health and well-being of older adults, including access to public health services, family support, and self-care capabilities. This is consistent with research indicating that health management behaviors positively impact the quality of life of older adults,³⁴ as well as self-care behaviors were positively associated with quality of life.³⁵ These findings highlight the importance of holistic healthcare.

Finally, the ability to perform ADL is significant in determining the quality of life for older adults in rural areas. Research demonstrates that older adults who can manage self-care well have better health and greater happiness.³⁶ Conversely, those with lower self-care abilities tend to experience worsening physical and mental health.³⁷

LIMITATIONS OF THE STUDY

This research focused on the elderly population in Phayao Province, which limits the applicability of the findings to other regions or urban societies in Thailand. The rural context encompasses cultural beliefs and traditions related to health and healthcare that may not have been fully explored, potentially affecting the interpretation of behaviors and health status within this group. Therefore, it is advisable to conduct qualitative research alongside this study.

RECOMMENDATION

This study identified employment status, exercise, family relationships, and ADL as key factors influencing the health of elderly individuals in rural areas. Therefore, it is recommended that policies focus on developing employment opportunities tailored to the elderly, promoting safe and accessible exercise programs within communities, and strengthening family and community support systems to enhance mental health and overall quality of life. At the practical level, rehabilitation programs should be designed for elderly individuals with mobility limitations and challenges in daily activities, with approaches that can be effectively implemented in healthcare settings and communities. Therapeutic activities and mental health support groups should also be established to reduce stress and promote social engagement. For future research, longitudinal studies are recommended to track changes in elderly health over time, as well as comparative studies in various contexts, such as between urban and rural settings, to inform the development of policies that address the diverse needs of elderly populations across different regions.

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