Determinants of Self-reported Health among Older Adults in Thailand

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Abstract

Background Rapidly aging societies have become one of the most concerning issues that many countries, including Thailand, are now facing. Thailand is now in the stage of population aging in which the working-age share of the population is shrinking and the older-age share is increasing. Understanding the factors that influence health outcomes among the elderly becomes increasingly important. As people live longer, ensuring they maintain good health is essential to reduce the burden on healthcare systems and society.

Methods This study utilizes data from the 2021 Survey of the Older Persons in Thailand collected by National Statistics Office (NSO). The study focuses on a person aged sixty years and above, defined as an older adult, resulting in a sample of 43,693 older persons. The binary logistic regression analysis was used to determine how demographic, economic, behavior and social environment factors affect elderly health.

Results For each additional year of age, the probability of having good health decreases. Males are more likely to have good health compared to females. Individuals with higher education are more likely to have good health compared to those with lower education. Universal healthcare has the least impact on good health. Older adults who can do activities of daily living without dependence and those exercise regularly have higher probability to have good health. Elderly living alone slightly decreases the likelihood of good health. Older adults who quit jobs deteriorated health.

Keywords: 1) Aging society 2) Self-reported health 3) Co-residence 4) Activities of daily living (ADL) 5) Elderly

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Introduction

The population is aging because lifespans have continued to increase due to developments in modern medical science. Rapidly aging societies have become one of the most concerning issues that many countries, including Thailand, are now facing. Thailand is now in the stage of population aging in which the working-age share of the population is shrinking and the older-age share is increasing. In 2022, the share of population 60 years and over in Thailand accounted for 19.46 percent. In 2040, the percentage of the population 60 years and over is forecast to reach 31.37 percent (Table 1 and Figure 1).

Table 1 Percentage of population 60 years and over

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
percent	19.46	20.17	20.91	21.66	22.44	23.22	24	24.76	25.5	26.19	26.85	27.48	28.09	28.69	29.28	29.85	30.4	30.91	31.37

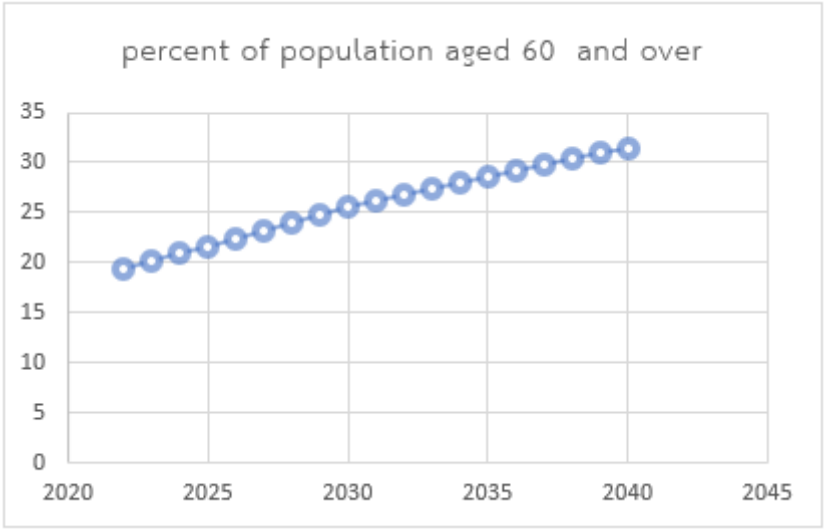

Figure 1 Share of total population 60 years and over in Thailand in 2022 with a forecast to 2040

As populations around the world continue to age, understanding the factors that influence health outcomes among the elderly becomes increasingly important. Self-reported health (SRH) is a widely used indicator that provides valuable insights into an individual's perceived health status. It is a subjective measure that encompasses both physical and mental health components, capturing an individual's overall perception of their well-being. It is one of the most widely used health and well-being indicators in general population surveys (Ng, 2015, p. 3). It also strongly predicts many health outcomes, including morbidity, mortality, functional limitations, and cognitive disorders (Bendayan, et al., 2017, p. 1410). Previous researchers have used self-reported health as an important indicator in understanding the subjective health and well-being of older adults (Bakshi, 2021, p. 1; Meng and D'Arcy, 2016, p. 1343).

The determinants of self-rated health (SRH) among the elderly are complex and multifaceted, influenced by a range of factors including socio-demographic characteristics, lifestyle behaviors, chronic conditions, psycho-

logical factors, and social support networks. Research indicates that self-rated health (SRH) is not only a powerful predictor of mortality and morbidity but also a useful tool for assessing the effectiveness of health interventions and public health strategies aimed at improving the quality of life among older adults. Despite its significance, there remains a need for comprehensive studies that explore the diverse determinants of self-rated health (SRH) in different contexts and populations.

This research also includes healthcare coverage and income source as determinants affecting elderly health. Medical expenses can be significant burden, especially for those on fixed income. Types of healthcare coverage differently alleviate financial stress, allowing older adults to focus on their health rather than worrying about the medical costs. Therefore, a secure income source gives older adults the resources needed to maintain their health, avoid financial stress, and support a high quality of life well into their later years

The objective of this research is to identify and analyze the key determinants of self-reported health among the elderly population. By exploring these determinants, the research seeks to provide a comprehensive understanding of the factors that contribute to the overall well-being of the elderly, comprising of demographic, economic, behavior and social environment factors. Therefore, the study would inform the development of targeted health interventions and policies that promote healthy aging and improve quality of life in later years. The remainder of this paper is organized as follows. Section 2 summarizes the results of previous studies on elderly health. Section 3 explains methodology, including the data and model. Section 4 presents, explains and discusses the estimation results, while conclusions are presented in section 5.

Literature Review

Although self-rated health (SRH) is a subjective measure of health, its importance has increased over time for several reasons. Firstly, there is recognition of the need to value a person's perception of their health alongside objective health indicators in health-related studies. Equally important is the strong association this indicator has been found to have with future mortality and future functional status (Huisman and Deeg, 2010, p. 651; Jylhä, 2009, p. 307).

Subjective health status was rated by the participants using a five-point scale (ranging from 1 to 5, with 1 indicating very good subjective health and 5 indicating very poor subjective health). Very good health, good health, and usually healthy outcome variables were divided into the good health group and very poor-health and poor-health outcome variables were assigned to the poor-health group (Chongthawonsatid, 2022, p. 82; Shrestha, et al., 2024, p. 3; Godaert, et al., 2018, pp. 92-93; Stroope, et al., 2022, p. 5; Kim, Yoon and Ko, 2017, p. 3).

As people age, their health is influenced by a variety of factors that go beyond just medical conditions or genetic predispositions. Key factors play a significant role in shaping the health outcomes of the elderly: socio-economic factors, behavioral factors, and

the social environment. Understanding these influences is crucial for developing effective strategies to improve the well-being and quality of life for older adults.

Socio-economic factors play a significant role in shaping the health outcomes of the elderly. These factors encompass a wide range of elements such as age, gender, marital status, education, occupation, and income level, all of which can have profound effects on the well-being of older adults. Age is a fundamental factor affecting the health of elderly individuals. Previous research (Bakshi, 2021, p. 9; Chongthawonsatid, 2022, p. 83) showed that each additional year of age resulted in a decrease in odds of good health. Advancing age is associated with an increased risk of chronic diseases, cognitive decline, immune system aging, functional limitations, frailty, and psychological challenges, all of which contribute to the overall health outcomes of older adults.

Sex plays a significant role in influencing the health of elderly individuals, as it affects both biological and social determinants of health. Bakshi (2021, p. 9) studied older adults in India and found that the odds in favor of higher status of self-rated health are 0.85 times lesser among the older males when compared to the older females. In other words, Chongthawonsatid (2022, p. 83) concluded that older females have lower probability to have good health in Thailand. Marital status has been shown to significantly affect the health of elderly individuals, with a considerable body of research indicating that being married is generally associated with better health outcomes compared to being single, widowed, or divorced (Bakshi, 2021, p. 9). Nevertheless, Chongthawonsatid (2022, p. 83) studied elderly's health in Thailand and found that older persons who are divorced, separated, or widowed have lower probability to have good health compared to single elderly.

Educational attainment has been used as a primary indicator of SES in many studies, and it has played a pivotal role in the analysis of the SES-health gradient particularly for the older people. Education significantly affects the health of elderly individuals, and previous research has consistently demonstrated a strong link between higher education levels and better health outcomes in later life. Bakshi (2021, p.9) and Chongthawonsatid (2022, p. 83) found that elderly individuals with a higher level of education tend to have better health than those with a lower level of education.

Occupation is a key determinant of socioeconomic status (SES), which significantly influences health outcomes in later life. Higher-status occupations, such as professional or managerial roles, are often associated with better income, job security, health benefits, and access to healthcare resources, contributing to better health outcomes. In contrast, lower-status occupations, such as manual labor or service jobs, often involve lower pay, fewer benefits, and greater exposure to health risks. Chongthawonsatid (2022, p. 82) concluded that people who work for private companies tend to have poorer health than those who run their own businesses.

Income level is one of the most critical socio-economic determinants of health among the elderly. Higher income often translates into

better access to healthcare services, healthier food, safer living environments, and the ability to engage in leisure activities that promote physical and mental health. Conversely, low income can lead to financial stress, inadequate nutrition, poor living conditions, and limited access to medical care, all of which can negatively impact health. People with a lower socio-economic status (SES) generally experience poor heath because a low income prevents them from purchasing quality goods and services and force them with unhealthy cheaper options (Marmot, 2004, p. 39).

Behavioral factors, including lifestyle choices like diet, physical activity, alcohol consumption and smoking, also have a profound effect on elderly health. These lifestyle factors can either contribute to healthy aging or increase the risk of various health problems.

Activities of Daily Living (ADLs) refer to basic self-care tasks that individuals perform daily, such as eating, bathing, dressing, toileting, transferring (moving from one place to another), and continence. The ability to perform ADLs independently is a key indicator of functional status in older adults. Studies (Thanakwang, Isaramalai and Hatthakit, 2014, p. 1211; Wallack, Wiseman and Ploughman, 2016, p. 1) emphasized the need to maintain a good level of physical capacity to enhance successful healthy ageing. Shrestha, et al. (2023, pp. 6-7) supported the hypothesis that older adults who received assistance with activities of daily living from their families had better self-rated health.

Exercise plays a crucial role in promoting health and well-being among older adults. Research consistently shows that regular physical activity benefits the elderly by enhancing physical fitness, mental health, cognitive function, and overall quality of life. Smoking has detrimental effects on nearly every aspect of health, leading to a wide range of serious diseases, decreased quality of life, and increased mortality. Elderly behavior, such as alcohol consumption, significantly affects health outcomes. These risks include an increased likelihood of chronic diseases, cognitive decline, falls and injuries, medication interactions, nutritional deficiencies, and weakened immune function. It is generally recommended that older adults limit or avoid alcohol to minimize these health risks and promote healthy aging.

Considerable evidence shows that healthy lifestyle habits, such as physical activity and maintenance of a healthy diet, can slow the deterioration of cognitive function, quality of life and physical function in chronically ill (older) populations (Hu, Wallace and Tesh, 2010, p. 75; Frith and Loprinzi, 2017, pp. 1272-1273).

Additionally, the social environment, encompassing aspects like community support, social networks, and family relationships, can significantly affect both physical and mental health in later years. Together, these three factors highlight the complex interplay of influences on elderly health, underscoring the need for a comprehensive approach to support aging populations. 3 factors: loneliness (social isolation), community engagement and social engagement.

Bakshi (2021, p. 9) indicated that elderly people who live with others tend to have bet-

ter health than those who live alone. Co-residence often provides elderly individuals with access to informal caregiving support, which can positively impact their physical health. Studies have shown that elderly individuals living with family members, particularly adult children, are more likely to receive assistance with daily activities such as bathing, dressing, cooking, and medication management.

Active engagement in community activities and participation in social groups can have a positive impact on elderly health. Community engagement provides opportunities for social interaction, which can improve mood and reduce feelings of loneliness. Feng, Wang and Jones (2013, p. 152) indicated that social participation is an important health behavior for quality of life and cognitive function among chronically ill older people in China.

Engaging in social activities, maintaining relationships are crucial aspects of healthy aging. Working at old ages is regarded as a good way to keep one's health according to the idea of productive aging. Minami, et al. (2015, p. 1) concluded that retirement worsened mental health and high level functional capacity in people aged 65 years and over in Japan. The study showed that working is an effective way of social participation for older people in Japan. Chung, Kim and Choi (2013, p. 63) concluded that the perceived subjective health status was higher in the group that was employed.

Methodologies

Research Data

This study utilizes data from the 2021 Survey of the Older Persons in Thailand collected by National Statistics Office (NSO). NSO used a questionnaire on individuals aged 50 and above. In terms of design, it was a stratified two-stage sample survey. Overall, 83,880 households from 77 provinces in 5 regions (Bangkok, Northern region, Northeastern region, Central region, and Southern region) were available for interview. The study focuses on a person aged sixty years and above, defined as an older adult, resulting in a sample of 43,693 older persons.

Outcome Variable

The outcome variable is self-rated health (SRH). Wu and Schimmele (2006, p. 140) indicated that self-rated health is a sensitive and reliable indicator of an individual's current health status. Self-rated health was assessed by asking, "In general, how do you rate your health?". The response choices were "very good", "good", "fair", "poor" and "very poor". For this study, the 5-response likert scale was dichotomized by merging "very good" and "good" as good and the remaining three as poor, consistent with the research of Godaert, et al. (2018, pp. 92-93), Stroope, et al (2022, p. 392) and Chongthawonsatid (2022, p. 82). Prior studies documented the validity of this single item to assess subjective health. Specifically, it has good face validity, criterion validity and predictive validity (Shrestha et al, 2024, p. 2). Furthermore, Idler and Benyamini (1997, p. 26) indicated that subjective assessment of health was very highly predictive of mortality and other health outcomes.

Independent Variables

This study included 4 determinants of

elderly health: demographic factors, economic factors, behavior factors and social environment factors.

Demographic factors significantly influence health outcomes, as they shaped access to resources, living conditions, behaviors, and overall quality of life. This study includes age, male, married and educational level.

Age is years of age, considered as a continuous variable. Male, which is a categorical variable, is equal to 1 if male and 0 if female. Married is a dummy variable coded 1 if single and 0 if married, divorced, or separated. Educational level is categorized into 3 groups by skill level: low, intermediate and high skilled education. Low skilled educational level includes pre-primary education, primary education and lower secondary education; intermediated skilled educational level includes upper secondary and post-secondary education and high skilled educational level includes university education. Education is coded 1 if low-skilled education; coded 2 if intermediate skilled education and 3 if high skilled education.

Chongthawonsatid (2022, p. 83) indicated that socioeconomic status (SES) related to health inequalities is assessed by education, employment, income, wealth and social status. Economic factors in this study include income source, wealth and medical rights.

This study used income source instead of income level with 2 reasons: 1) Not all older adults are still working, so they may rely on savings or financial support from family to sustain their living expenses 2) Using income source instead of just income level to determine the effect of income on elderly health provides a more comprehensive understanding of the economic factors that influence health outcomes. It considers the stability, predictability, and associated psychosocial impacts of income, all of which play crucial roles in shaping health behaviors, access to healthcare, and overall well-being in older adults. Thus, income source is categorized into 5 groups: 1) employment 2) pension 3) government support such as provident fund, state welfare card or national saving fund 4) family support and 5) other support such as savings.

Wealth is a better indicator of measures for the economic status of older people than income, as it includes the stock of assets that can be used to live on as necessary (Marmot, 2004, pp. 39-40). Wealth, the value of assets, including houses, land, and vehicles, is a categorical variable giving a value of 1 if no wealth, 2 if 1-99,999 baht, 3 if 100,000-999,999 baht and 4 if 1,000,000 and more.

Types of healthcare coverage significantly impact elderly health in several ways, as they influence access to care, autonomy in decision-making, quality of care, and overall well-being. This study categorized medical rights into 4 groups: universal healthcare, social security, government or state enterprise and others such as private insurance.

Behavioral factors like Activities of Daily Living (ADL) and exercise have a significant impact on elderly health. Self-care limitation is inability to function within a social environment. The survey asked respondents whether they can dress themselves, eat, bathe, toilet, or walk outside their home. Respondents who

reported difficulties with any of these tasks were considered to have a self-care limitation. Activities of Daily Living (ADLs) include fundamental self-care tasks, such as: - Bathing or showering - Dressing - Eating - Using the toilet - Walking or transferring (e.g., moving from bed to chair) - Grooming (brushing teeth, hair care). In this study, ADL is dummy variable equal to 1 if respondent has no difficulty in self-care and 0 if respondent has limitation in self-care.

For exercise, questionnaire asked the respondent whether they exercise regularly, assigning a value of 1 if they answer that they exercise regularly and a value of 0 if they answer that they do not exercise regularly. Regular exercise refers to exercising at least 1-2 days per week.is

Social environmental factors play a crucial role in influencing the health and well-being of elderly individuals. These factors encompass the social, cultural, and physical surroundings in which older adults live and interact. Elderly individuals who live with family members have better mental health, reduced feelings of loneliness, and enhanced physical health due to the support received in daily activities and healthcare management. Agrawal, S. (2012, p. 87) concluded that elderly who are living alone are likely to suffer more from both chronic illnesses, such as asthma and tuberculosis, and acute illnesses, such as malaria and jaundice, than those elderly who are living with their family in India. This study used co-residence as dummy variable coded 1 if living alone and 0 if living with other persons such as child, grandchild or relatives.

Engagement in economic activity was found to improve the subjective health status (Kim, Yoon and Ko, 2017, p. 4). Respondents are questioned “have you participated in village activities or religious events?” If the answer is "yes," assign a value of 1. If the answer is "no," assign a value of 0. This study used working status (work or not) as a proxy of social activity. Work status is equal to 1 if old persons work and 0 if not work.

Table 2 Definitions of variables in the study

Variables	Definitions
Health	Dummy variable taken value of 1 if good health and 0 if poor health
Age	Years of age
Male	Dummy variable taken value of 1 if male and 0 if female
Married	Dummy variable taken value of 1 if single and 0 if married, divorced, separated, etc
Educational level	Categorical variable: 1=low skilled education, 2=intermediate skilled education and 3=high skilled education
Income source	Categorical variable: 1=work, 2= pension, 3=subsidies from government, 4= family and 5 = others
Health care coverage	Categorical variable: 1 = universal healthcare, 2=social security, 3=government or state enterprise and 4 = others
Wealth	The value of assets such as house, car, land, etc.

Variables	Definitions
	Categorical variable: 1 if no wealth, 2 if 1-99,999 baht, 3 if 100,000-999,999 baht and 4 if 1,000,000 and over
Activities of daily livings (ADL)	Dummy variable coding 1 if without dependence and 0 if with dependence
Exercise	Dummy variable coding 1 if exercise regularly and 0 if not
Co-residence	Dummy variable coding 1 if living alone and 0 if living with other people
Social engagement	Dummy variable coding 1 if participating in social or religion activities and 0 if not
Work status	Dummy variable coding 1=work and 0=not work

Statistical Analysis

The binary logistic regression analysis can be used to determine the relationship between a binary response and continuous or categorial explanatory variables. The binary logistic regression model is given below,

$$\log\left[\frac{P(Y)}{1-P(Y)}\right] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots .. + \beta_n X_n$$

The left-hand side is called the log-odds or logit. The logistic regression model has a logit that is linear in X. Hence:

$$P(Y) = \frac{e^{\beta_0+\beta_1 X_1+\beta_2 X_2+\cdots\beta_n X_n}}{1+e^{\beta_0+\beta_1 X_1+\beta_2 X_2+\cdots\beta_n X_n}}$$

Where P(Y) is the log (odds) of the outcome variable, Y is dichotomous equal to 1 if older persons having good health and 0 if older persons having poor health. β_1, β_2,.....,β_n are regression coefficients; β_0 is the intercept; x_1, x_2,...., x_n are age, gender, marital status, education, medical rights, income source, ADLs, exercise, co-residence, social activities, work, and wealth. β_s are estimated by the maximum likelihood estimator MLE approach. Again, calculus is used to compute the marginal effects. In the case of logistic regression, F(X) = P(Y=1|X), and Marginal Effect for Xk = P(Y=1 |X) * P(Y = 0|X) * bk.

Results and Discussion

The data in the Table 3 provides insights into demographic, economic, behavior and social environment factors and health-related variables, broken down by gender. It shows that 46.82% of the population reports being in good health, with a higher percentage of men (51.41%) reporting good health compared to women (43.27%). Most individuals are married or in a similar partnership (95.15%). Regarding education, a large portion is low-skilled (86.42%), with men having a slightly higher percentage in higher education categories. Income sources show family support as the primary source for women, while men are more likely to work. In terms of healthcare coverage, the majority of the population (81.44%) is covered by universal healthcare. Wealth distribution reveals that more women fall into the lower wealth category. A greater proportion of men exercise regularly (59.92%) compared to women (52.97%), and more men live with their families. Finally, men participate slightly more in social activities and are more likely to work compared to women.

Table 3 Summary statistics of variables used in the study

Variables	All (%)	Male (%)	Female (%)
Health			
-good health	46.82	51.41	43.27
-poor health	53.18	48.59	56.73
Married			
-single	4.85	2.84	6.42
-married, separated, divorced, etc	95.15	97.16	93.6
Education			
-low skilled	86.42	83.16	88.94
-intermediate skilled	6.04	8.38	4.22
-high skilled	7.55	8.46	6.84
Income source			
-work	34.03	44.83	25.66
-pension	8.12	10.37	6.38
-government	21.02	17.69	23.60
-family	35.73	26.07	43.20
-others	1.10	1.04	1.15
Healthcare coverage			
-universal healthcare	81.44	80.0	82.55
-social security	1.37	1.65	1.15
-government or state enterprise	16.52	17.60	15.68
-others	0.68	0.74	0.63
Wealth			
-no wealth	21.34	12.9	27.88
-0-99,999 baht	10.55	10.15	10.86
-100,000-999,999 baht	51.59	56.77	47.58
-more than 1,000,000 baht	16.52	20.18	13.68
Activities of daily living			
-no dependence	96.11	96.69	95.67
-dependence	3.89	3.31	4.33
Exercise			
-regularly	56.0	59.92	52.97

Variables	All (%)	Male (%)	Female (%)
-not regularly	44.0	40.08	47.03
Co-residence			
-live alone	12.36	9.98	14.20
-live with family	87.64	90.02	85.80
Social activities			
-participate	51.86	52.69	51.23
-not participate	48.14	47.31	48.77
Work			
-work	37.48	48.01	29.33
-not work	62.52	51.99	70.67

Table 4 presents results of logistic regression. The pairwise correlation coefficients between the independent variables are all well below the threshold of 0.5, indicating that no two variables are highly correlated. The value of log likelihood of 7517.63 resulting in a p-value which is less than the commonly used significance level of 0.05. Therefore, the value of Psudo R-squared is 0.32. Thus, the full model provided valuable information in predicting the outcome variable and the model is well-fitted.

For each additional year of age, the probability of having good health decreases by 1.1%. The reason is that elderly individuals may experience a decline in mobility and physical fitness, which are essential for maintaining good health. Males are 2% more likely to have good health compared to females. Consistent with the study of Chongthawonsatid (2022, p. 83), females are less likely to have good health compared to males. Being single slightly increases the probability of having good health by 1.1%, though this effect is not statistically significant. The reason is that health outcomes in older adults often rely more on long term personal health habits such as exercise or diet. Therefore, older adults often have other sources of social support which can provide emotional support and companionship, reducing the exclusive importance of a spouse for emotional well-being. This research has both variable which is exercise and co-residence as independent variables.

Individuals with intermediate skilled education are 7.9% more likely to have good health compared to those with low skilled education. Those with high skilled education are 14.3% more likely to have good health. This conclusion is consistent with the findings of Bakshi (2021, p. 9), Kim, Yoon and Ko (2017, p. 4) and Saengprachaksakula (2015, pp. 154-155).

People with social security as their healthcare coverage are 5.4% more likely to have good health. Individuals with government or state enterprise healthcare coverage have a 4.8% higher likelihood of good health. Group with private insurance is also 7.4% more like-

ly to have good health. Saengprachaksakula (2015, p. 160) studied the determinants of Thai active ageing and found that universal healthcare has the least impact on good health.

Old persons receiving pension and other source of income have no significant impact on health compared to those receiving income from employment due to statistically insignificant coefficient. While pensions provide stable income, the amount is usually fixed and may not adjust significantly over time. This limited income might not cover rising healthcare costs, inflation, or unexpected expenses, potentially limiting its impact on improving health outcomes.

Old people receiving government support are 8.6% less likely to have good health compared to working elderly. Those relying on family income are 5.1% less likely to have good health. The reason is that older individuals who continue working often engage in some level of physical activity, even if it's light work. Physical activity is crucial for maintaining muscle strength, flexibility, and cardiovascular health. Those relying on income without working may experience reduced movement, leading to muscle loss, joint stiffness, and other health issues related to a sedentary lifestyle. Work can promote more active habits and routines that prevent the onset of such diseases.

Elderly who can do activities of daily living increase the probability of good health by 43.2%. Older individuals who exercise are 10.1% more likely to have good health. Elderly living alone slightly decreases the likelihood of good health by 1.1% compared to those living with family. Bakshi (2021, p. 9) concluded that old adults who co-reside have 1.41 times higher odds in favor of higher status of self- rated health when compared to old adults who living alone. Engaging in social activities increases the probability of good health by 4.8%. Being socially connected often encourages healthier behaviors, such as better adherence to medical treatments, regular physical activity, and improved nutrition (Holt-Lunstad, Smith and Layton, 2010, p. 1). Working increases the probability of good health by 7.2%. Working at old ages is regarded as a good way to keep one's health according to the idea of productive ageing (Minami, et al., 2015, p. 1). An increase in wealth raises the likelihood of good health, that is, old adults with wealth 100,000-900,000 baht (more than 1,000,000 baht) increase the probability of being good health by 1.8% (6.3%) compared to no wealth.

Table 4 The results of demographic, economic, behavior and social environment factors on elderly health

Variables	Coefficient	Std error	z	P value of coefficient	Marginal effect
Age	-0.053*	0.002	-32.13	0.00	-0.011
Male (female as reference)	0.103*	0.022	4.63	0.00	0.02
Single (married, divorced, and separated as reference)	0.054	0.05	1.08	0.279	0.011

Variables	Coefficient	Std error	z	P value of coefficient	Marginal effect
Education (low skilled education as reference)					
Intermediate skilled education	0.375*	0.047	7.91	0.00	0.079
High skilled education	0.682*	0.059	11.49	0.00	0.143
Healthcare coverage (universal healthcare as reference)					
Social security	0.257*	0.091	2.82	0.005	0.054
Government or state enterprise	0.229*	0.038	6.04	0.00	0.048
Other medical rights	0.351*	0.129	2.72	0.007	0.074
Income source (employment as reference)					
Pension	-0.002	0.075	-0.03	0.977	-0.0004
Government	-0.41*	0.048	-8.51	0.00	-0.086
Family	-0.244*	0.044	-5.54	0.00	-0.051
others	0.017	0.107	-0.15	0.877	-0.003
ADL	2.057*	0.127	16.23	0.00	0.432
Exercise	0.481*	0.022	22.28	0.00	0.101
Co-residence	-0.053**	0.032	-1.64	0.10	-0.011
Social activities	0.231*	0.021	10.78	0.00	0.048
Work	0.343*	0.042	8.09	0.00	0.072
Wealth (no wealth as reference)					
0-99,999 baht	-0.023	0.04	-0.57	0.572	-0.005
100,000-999,999 baht	0.085*	0.028	2.96	0.003	0.018
more than 1,000,000 baht	0.298*	0.037	8.06	0.000	0.063
Constant	0.883*	0.179	4.94	0.00	-

Note: ** and * denote significant at the 5 and 10% level respectively

Conclusion

The study on the effects of demographic, economic, behavioral, and environmental factors on elderly health found that factors such as age, sex, education, healthcare entitlement, income from government and family, activities of daily living, exercise, participation in social activities, employment, and wealth had a statistically significant impact on elderly health at the 0.05 level. In contrast, marital status, income from pensions, and income from savings did not significantly affect elderly health, as their coefficients were not statistically significant.

The question a policymaker has to address is how to make older adults feel healthier. From the result of the study, researcher recommended 1) Promote Healthy Aging: Since age is negatively associated with good health, policies should focus on promoting healthy aging initiatives, such as regular health checkups, nutrition programs, and targeted interventions

for chronic diseases common in older adults. 2) Support for Women's Health: With males more likely to report good health compared to females, it is important to develop policies that address women's health issues, such as increasing access to healthcare services that target conditions prevalent among elderly women. 3) Improve Access to Education: Education significantly impacts health, with both intermediate and high-skilled education levels associated with better health outcomes. Policies should encourage lifelong learning and provide educational opportunities, especially for older adults, to improve health literacy and promote healthier behaviors. 4) Promote Social Engagement: Since social activities are positively associated with good health, policies should encourage community-building activities and social networks for the elderly. Initiatives like senior centers, clubs, and community outreach programs can help reduce isolation and improve mental and physical well-being. 5) Since exercise contributes to good health in the elderly, promoting physical activity among older adults should be encouraged, as it is one of the most cost-effective ways to improve their health. 6) Facilitate Employment Opportunities for Older Adults: Employment is associated with better health outcomes. Policies that support flexible, age-appropriate work opportunities can help keep older adults engaged and healthy, while also addressing the challenges they face in maintaining employment. These recommendations focus on improving both the physical and socioeconomic environments that impact elderly health, ensuring holistic well-being for the aging population.

Limitation

Perhaps more problematic is that, despite the global use of self-rated health in research, some researchers have raised concerns about using a single item to measure subjective health status in middle and low-income nations. Similarly, measurement bias cannot be ruled out in the measurement of the two predictors of interest based on dichotomous responses. The next research study could examine factors affecting elderly health by region. This approach would allow for an analysis of regional differences in healthcare access, lifestyle habits, and environmental conditions, all of which may uniquely impact elderly health.

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