

The Factor Analysis of Quality of Life of the Ageing Population in Thailand

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Abstract

This study explores the WHOQOL-BREF factor structure, proposes an alternative model, and investigates socio-demographic determinants of Quality of Life (QoL) in Thai adults aged 60 and over. Data from the 11th Regional Health (RH) spanning 2012-2018, with 34,800 participants, were analyzed. Independent variables include age, gender, marital status, education, occupation, income source, caregiver, and medical treatment place, with QoL scores as the dependent variable. Descriptive statistics, factor analysis, and regression were employed, revealing diverse QoL aspects across physical, psychological, social, and environmental domains. Key findings include varying satisfaction levels and insights into pain frequency, mobility, and life meaning.

An alternative factor model consists of three components: environment and enjoyment, life satisfaction, and physical health, with reliability values of 0.924, 0.892, and 0.833, respectively. High socio-economic individuals generally have higher environment and sense of enjoyment scores than the overall mean, except for females aged 75-85. Among different age groups, high socio-economic individuals score lower in the 75-85 age group, while low socio-economic individuals score higher, particularly in regional health (RH) 1, 3, 4, 11, and 12. Life satisfaction is notably higher for both high and low socio-economic males, especially in RH 6-10. In the 75-85 age group, both high and low socio-economic individuals tend to have lower physical health scores, except for the low socio-economic group in RH 3-5 and RH 11-12. In conclusion, low socio-economic status correlates with distress and poor health

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outcomes, necessitating social and psychological support to enhance overall QoL, addressing physical and mental well-being.

Keywords : Factor Analysis, Quality of Life, Ageing Population, WHOQOL-BREF

Introduction

The increasing longevity worldwide, as noted by the World Health Organization (World Health Organization, 2022), doesn't guarantee a better quality of life (QoL) for older adults. Consequently, there's growing interdisciplinary interest in researching QoL, with implications for health services, policymaking, and treatment efficacy evaluation. This has led to assessments of QoL instruments and investigations into predictors of QoL.

The 26-item WHOQOL-BREF questionnaire is widely used for assessing QoL, with approximately 100 culturally adapted translations available (World Health Organization, 2023). However, its factor structure varies, necessitating further assessment. While numerous studies report a 4-domain model (Xiong, 2022; Biagini, Bastiani & Sebastiani, 2022; Lodhi, Montazeri, Nedjat, Mahmoodi, Farooq & Yaseri et al., 2019), they fail to explore alternative factor models that might offer better insights into the data.

Existing research on the WHOQOL-BREF questionnaire for assessing the QoL in older adults in Thailand has mainly focused on the common 4-domain model, neglecting the exploration of alternative factor models. This gap underscores the necessity for a detailed examination of the instrument's factor structure within Thailand's context, considering diverse socio-demographics and challenges of aging. Moreover, comprehensive studies on predictors of QoL among Thai older adults are lacking, despite the growing elderly population and implications for public health and healthcare costs.

QoL declines with age and is tied to health outcomes. Predictors of QoL, beyond health factors, include socio-demographic characteristics. Thailand had about

12.7 million individuals aged 60 and over in 2022, making up 19.21% of the total population (Statista Research Department, 2024). The QoL of older adults is a pressing public health issue due to increased life expectancy. However, research on this topic in Thailand is scarce.

Objectives

1. to examine the factor structure of WHOQOL-BREF among Thai older adults aged 60 years and over.
2. to propose an alternative factor model for measuring their QoL
3. to ascertain the socio-demographic determinants influencing their QoL.

Methods

Data and variables

The study analyzed secondary data on adults aged 60 years and over, sourced from the Regional Health (RH) offices of Thailand's Ministry of Public Health. Data from 34,800 adults between 2012 and 2018 were collected via simple random sampling from elderly association membership lists annually, following a cross-sectional approach.

This study received approval from the Research Ethics Committee for Science, Technology, and Health Science (PSU.PN.1-003/62) at Prince of Songkla University, Pattani Campus.

Dependent variables

The WHOQOL-BREF questionnaire, contains 26 items. Respondents rated items on a 5-point Likert scale, with negative item scores recalibrated positively.

Independent variables

Socio-demographic factors encompassed gender, age, marital status, education, occupation, income source, caregiver, and medical treatment location. Age was grouped into six levels, marital status into four categories, and education into five

levels. Occupation, income source, caregiver, and treatment location were also categorized. RH was categorized into 12 groups, with RH13 combined with RH4 due to data limitations. Years spanned seven categories from 2012 to 2018.

Steps of analysis

The data analysis aims to examine the associations between QoL and socio-demographic factors. Exploratory factor analysis will condense the 26 dependent variables into a more manageable set of linear combinations.

Statistical analysis

The R statistical program will be utilized for all statistical analyses.

Descriptive analysis

Socio-demographic factors were summarized with frequency distributions and percentages, while WHOQOL-BREF items were displayed via a stacked bar chart.

Factor analysis

The factor model analyzes questionnaire responses, aiming to group highly correlated items while minimizing correlations between groups (Goretzko, Pham & Bühner, 2021). It reduces response variables by forming factors representing latent variables. These factors are derived from weighted linear combinations of questions and rotated to optimize interpretation. The choice of rotation method impacts data interpretation, with promax suitable for capturing correlations between factors. Uniqueness indicates variance unexplained by the model, informing variable inclusion/exclusion (Shrestha, 2021). Chi-squared tests assess model fit, while loadings estimate correlations between factors and variables. Weights are assigned based on loadings to classify variables into subgroups, aiding in data interpretation.

Reliability analysis

Reliability analysis assesses measurement scale consistency, commonly using Cronbach's alpha post-factor analysis. This coefficient measures internal item consistency, where higher values indicate greater coherence. It's calculated using item variances and total variance across all items.

Multiple linear regression techniques

The multiple linear regression model investigates the association between QoL factor scores and socio-demographic characteristics.

Results

The study included 34,800 adults aged 60 and over from 13 RH of Thailand between 2012 and 2018. Participation increased from 4,800 to 5,200 adults annually after 2016. Each region typically had 2,800 participants, except RH 13, which had 1,200. Elderly participants' socio-demographic characteristics: Female participants slightly outnumbered males (52.6% compared to 47.4%). The majority were married (97.31%) and had completed primary school education (82.12%). Vendors constituted the largest occupation group (58.07%), and 44.56% received elderly allowances. Nearly all elderly lived with their spouses (87.87%) and utilized government hospitals for healthcare (95.57%) as shown in Table 1.

Table 1 Elderly participants' socio-demographic characteristics

Socio-demographic factors	Number	Percent
Gender-age group		
Male		
60-65	5312	15.3
66-74	5322	15.3
75-85	5877	16.9

Table 1 (Continued)

Socio-demographic factors	Number	Percent
Female		
60-65	5874	16.9
66-74	5938	17.1
75-85	6477	18.6
Marital Status		
Single	425	1.2
Married	33,865	97.3
Widow	266	0.8
Divorce	244	0.7
Education		
Illiterate	450	1.29
Primary School	28,577	82.12
Junior High School	316	0.91
Bachelor degree	5,135	14.76
Other	322	0.93
Occupation		
Agriculture	1,263	3.63
Vendor	20,209	58.07
Employee	7,871	22.61
Pensioner	5,457	15.68
Source of income		
Elderly allowance	15,507	44.6
Business and employee	13,836	39.8
Pension	5,457	15.7

Table 1 (Continued)

Socio-demographic factors	Number	Percent
Caregiver		
Self care	48	0.1
Spouse	30,580	87.9
Children	3,803	10.9
Relatives	369	1.1
Medical treatment place		
Sub-district hospital	226	0.6
Government hospital	33,260	95.6
Private hospital	1,314	3.8

The WHOQOL-BREF analysis revealed that only 19% of older adults rated their overall QoL (item 26) as good/very good, while 17.8% were satisfied/very satisfied with their health (item 1). All older adults rated item 5, 11, 13, 16, 18, and 19 as good/very good, and item 2-4, 12, 22, and 24 as moderate/poor/very poor. For the physical health domain (item 2-4, 10-12, 24), 48.9% seldom suffered from physical pain, and 45.7% quite often suffered from pain. Participants were neither satisfied nor dissatisfied with their energy (71.9%), sleep (61.8%), daily living activities (59.4%), and work capacity (51.1%). Additionally, 55.6% wanted a moderate amount of medical treatment, and 70.5% were neither poor nor good in mobility. In the psychological domain (item 5-9, 23), participants were satisfied with life (40.6%), dissatisfied with themselves (42.9%), and neither satisfied nor dissatisfied with their body appearance (74.9%). Some participants could concentrate moderately (40.7%), while 37.6% experienced frequent negative feelings. Regarding social relationships (item 13-14, 25), participants were satisfied with personal relationships (40.4%), and neither satisfied nor dissatisfied with friend support (55.7%) and sex life (52.3%). In the environment

domain (item 15-19, 22), 35.5% were neither satisfied nor dissatisfied with physical safety, 39.5% were satisfied with living conditions, and 77.2% with transport. Participants could meet moderate needs (54.2%), and 36.8% had a very healthy physical environment. Correlation coefficients within each domain vary: physical (0-0.40), psychological (0.22-0.51), social relationships (0.41-0.53), and environmental (0.35-0.55) as shown in Figure 1.

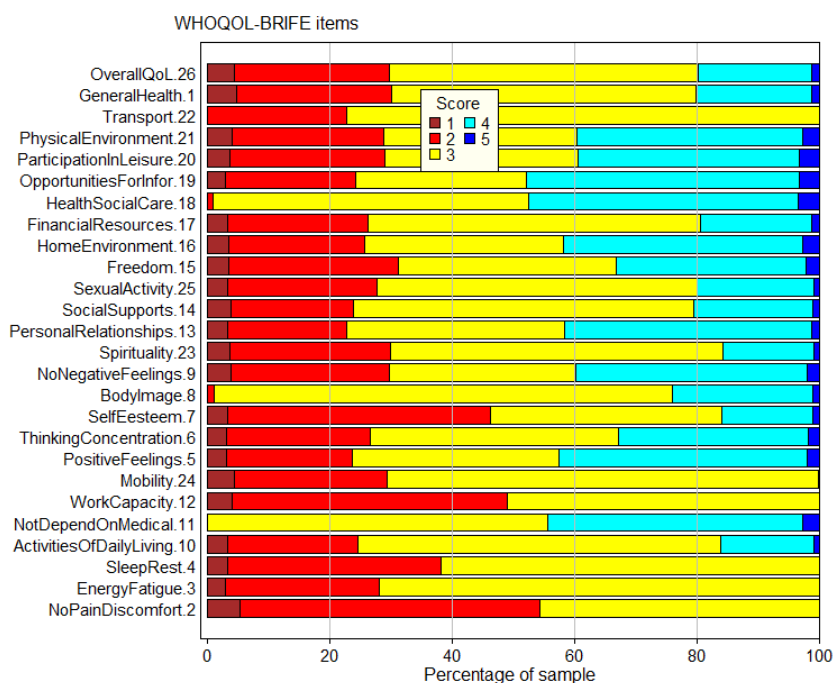


Figure 1 Percent of responses

Items across domains, especially item 5, 9, 10, and 23 exhibit high correlation. Based on the results of the factor analysis, we have opted to utilize the three-factor model because they are more suitable for this dataset. The three-factor model was utilized to construct QoL dependent variables from WHOQOL-BREF items. Table 2 presents item loadings exceeding 0.3 in magnitude and item uniqueness (Unique). The results are presented by ordering the items by their loadings for each factor. Some

variables (item 6-8, 15) are presented in more than one group. Item 2 has high uniqueness, so should be omitted from the factor model.

Table 2 Factor analysis results showing only loading greater than 0.3 for the three-factors model

Items	WHOQOL-BREF items	F1: Environment and sense of enjoy	F2: Life satisfaction	F3: Physical health	Unique
1	Not Dependence on medicinal substances and medical aids	0.922			0.516
5	Positive feelings	0.714			0.457
18	Health and social care: accessibility and quality	0.692			0.612
16	Home environment	0.660			0.480
13	Personal relationships	0.626			0.511
21	Physical environment	0.621			0.508
9	No Negative feelings	0.605			0.511
20	Participation in and opportunities for recreation/leisure activity	0.559			0.522
19	Opportunities for acquiring new information and skills	0.531			0.605
6	Thinking learning memory and concentration	0.406		0.387	0.490
15	Freedom, physical safety, and security	0.370		0.391	0.559

Table 2 (Continued)

Items	WHOQOL-BREF items	F1: Environ- ment and sense of enjoy	F2: Life satisfaction	F3: Physical health	Unique
7	Self-esteem	-0.300	0.970		0.382
8	Bodily image and appearance		0.849	-0.406	0.501
25	Sexual activity		0.627		0.434
26	The overall QoL		0.554		0.509
23	Spirituality/religion/ personal beliefs		0.549		0.459
17	Financial resources		0.541		0.472
10	Activities of daily living		0.539		0.508
14	Social supports		0.523		0.520
1	General health		0.512		0.516
12	Work capacity			0.798	0.532
4	Sleep and rest			0.530	0.704
3	Energy and fatigue			0.529	0.700
22	Transport			0.393	0.566
24	Mobility			0.371	0.671
2	No Pain and discomfort				0.959

Correlations between the residuals after fitting the three-factor model. Positive correlations are filled in black and negative correlations are filled in red. The factor model reduces correlation. However, there is a substantial correlation remaining between factors in the three-factor model, especially, between factors 1 and 2.

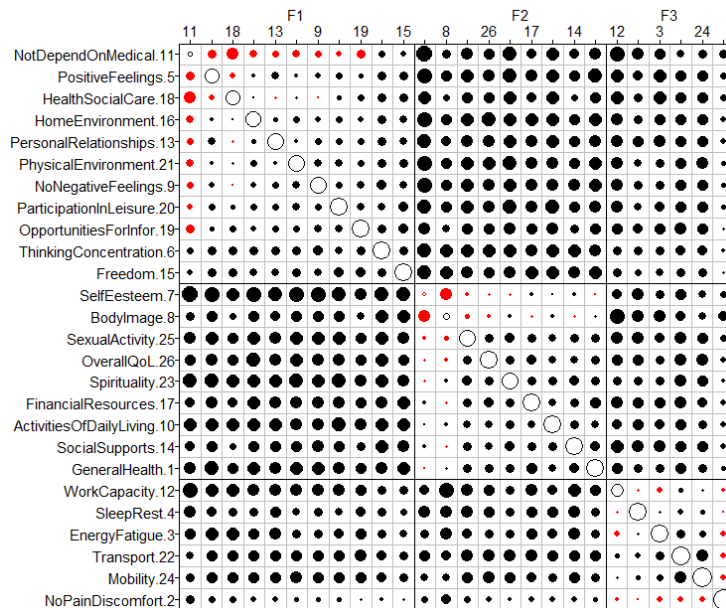


Figure 2 Correlation between residuals after fitting the three-factor model

The reliability analysis results for the three-factor models are based on coded outcome items, with loadings greater than 0.3, as displayed in Table 3.

Table 3 Reliability analysis results

Factor	Items included	α
1	5, 6, 7, 9, 11, 13, 15, 16, 18, 19, 20, 21	0.893
1	5, 6, 9, 11, 13, 15, 16, 18, 19, 20, 21	0.897
2	1, 7, 8, 10, 14, 17, 23, 25, 26	0.892
3	2, 3, 4, 6, 8, 12, 15, 18, 22, 24	0.758
3	3, 4, 6, 8, 12, 15, 22, 24	0.777
3	3, 4, 6, 12, 15, 22, 24	0.788

In our study, we have three dependent variables (y1: environmental and sense of enjoyment, y2: life satisfaction, y3: physical health) and nine predictor variables: gender-

age group (categorized into six levels), marital status (binary coded), education level (categorized into five levels), occupation group (categorized into four levels after merging state enterprise workers with company employees), source of income (categorized into three levels after merging self-employed individuals and employees), caregiver (binary coded), medical treatment place (binary coded), RH (categorized into 12 levels), and year (categorized into 7 levels). To address multicollinearity and confounding, we fitted a single predictor model. We then analyzed confidence intervals for environmental factors and enjoyment levels across 144 combinations of region, socio-economic status, and gender-age groups. With three predictors out of seven included in the models, we achieved r-squared values of 45.42%, 63.79%, and 57.98%. Q-Q plots from these three models are shown in Figure 3.

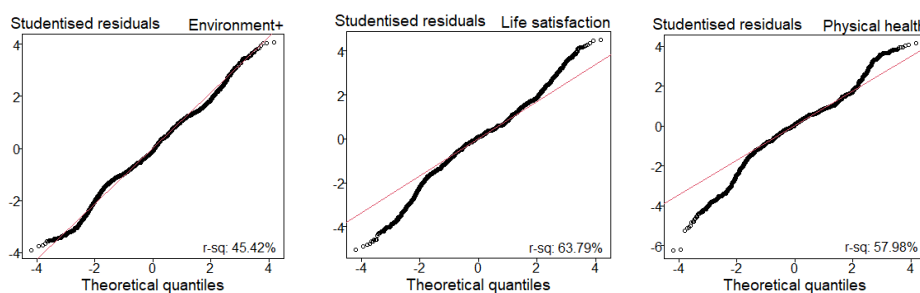
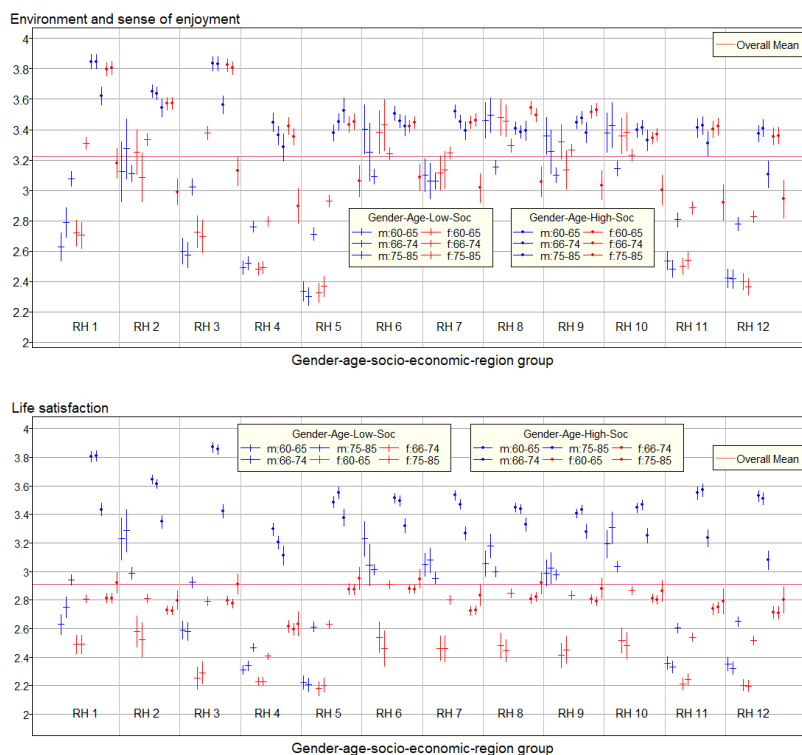


Figure 3 Quantile-quantile plots of the studentized residuals from linear regression models of the three domains

In the confidence interval plots, high socio-economic individuals generally exhibit higher scores in environment and sense of enjoyment compared to the overall mean, except for females aged 75-85. A distinct pattern emerges when comparing age groups, with high socio-economic individuals showing lower scores in the 75-85 age group, whereas low socio-economic individuals display higher scores in the same age group (particularly evident in RH 1, 3, 4, 11, and 12). Life satisfaction is notably higher than the overall mean for both high and low socio-economic males, particularly in RH

6-10. Among low socio-economic individuals, both males and females show consistently high life satisfaction in the 75-85 age group, a pattern mirrored in high socio-economic females (except for RH 2 and 6). In terms of physical health, high socio-economic individuals aged 60-74 generally exhibit higher scores, except in specific RH where the low socio-economic group fares better (e.g., RH 10). However, in the 75-85 age group, both high and low socio-economic individuals tend to have lower physical health scores, except for the low socio-economic group in RH 3-5 and RH 11-12 as shown in Figure 4.



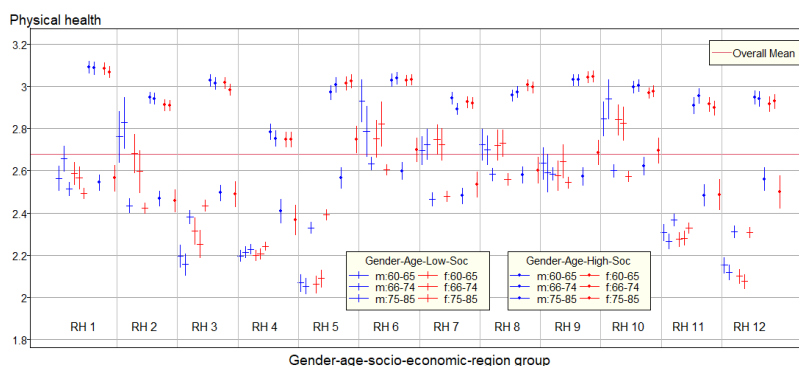


Figure 4 Confidence interval plots of a single predictor in the model

Discussion

The analysis results allowed us to categorize the domains into three factors. Factor 1 combines questions from the Environmental domain and aspects related to feelings and concentration from the Psychological domain, labeled as "Environment and Sense of Enjoyment". Factor 2 encompasses items predominantly focused on life satisfaction, covering aspects like self-satisfaction, appearance, sexuality, health, friendships, and finances, termed as "Life Satisfaction". The third factor primarily consists of questions related to physical health, including work capacity, daily activities, sleep quality, and mobility, labeled as "Physical Health".

In high socio-economic individuals, environment and sense of enjoyment scores are generally higher, except for females aged 75-85. may be attributed to various factors. Older females in this demographic might face unique challenges such as health issues, reduced social support, or limited resources compared to their male counterparts or younger individuals in the same socio-economic bracket. Additionally, the declining scores in this age bracket within high socio-economic groups compared to low socio-economic groups suggest specific stressors associated with aging in higher socio-economic strata, possibly due to increased expectations or pressures related to maintaining a certain lifestyle. The findings from this study align with research conducted in several countries such as Indonesia (Gondodiputro, Hidayati & Rahmiati, 2018), India (Singh, Palaniyandi,

Palaniyandi & Gupta, 2022; Ramadass, Rai, Gupta, Kant, Wadhwa & Sood et al., 2018), Poland (Cwirlej-Sozanska, Sozanski, Wisniowska-Szurlej & Wilmowska-Pietruszynska, 2018), and Hungary (Rétsági, Prémusz, Makai, Melczer, Betlehem & Lampek et al., 2020), where a consistent trend is observed. However, they may contradict findings from other countries such as the Netherlands (Gobbens & Remmen, 2019), Brazil (Hargreaves, Nakano, Han, Raposo, Ariza-Montes & Vega-Muñoz et al., 2021), and West Java (Vinsalia & Handajani, 2021). The consistent trend observed across various countries, regardless of age, suggests that socio-economic status plays a significant role in shaping perceptions of environment and enjoyment of life. However, it's noteworthy that age itself doesn't seem to be the determining factor, as evidenced by studies conducted in diverse cultural contexts. This indicates that while age may influence certain aspects of well-being, the broader socio-economic context remains a critical factor in understanding disparities in life satisfaction.

The higher life satisfaction among males in both high and low socio-economic groups, particularly in the 75-85 age bracket, could be influenced by factors like social support, financial stability, and a sense of purpose. This trend seems consistent across genders and socio-economic statuses, indicating a broader societal pattern. Research findings from countries like Indonesia (Gondodiputro et al., 2018), India (Ramadass et al., 2018), and Poland (Tanski, Wójciga & Jankowska-Polanska, 2021) support this trend. However, variations in life satisfaction across different countries such as the Netherlands (Gobbens & Remmen, 2019), Brazil (Resende Rodrigues, Santos Tavares, Aparecida Dias, Sousa Pegorari, Fiori Marchiori & dos Santos Tavares, 2017), Iran (Eliasi, Rasi & Tavakoli, 2017), Nigeria (Faronbi JO & Olaogun, 2017), and West Java (Vinsalia & Handajani, 2021), suggest that cultural, economic, and social differences play significant roles in shaping individuals' QoL. Health disparities and economic inequalities significantly influence life satisfaction among elderly men and women aged 75-85 (Carmel, 2019), with men facing higher health challenges and financial adversities (Schultz, Kelli, Lisko, Varghese, Shen & Sandesara et al., 2018), while women benefit more from social dynamics and societal changes (Galassi, Merizzi,

D'Amen & Santini, 2022). Recognizing women's roles is crucial in creating supportive environments, highlighting the complex nature of these disparities.

Physical health tends to be above average among both males and females aged 60-65 and 66-74 in the high socio-economic group. However, there are instances where the low socio-economic group exhibits better physical health, possibly due to factors like community support networks or access to preventive healthcare services. These findings align with research conducted in various countries such as the Netherlands (Gobbens & Remmen, 2019), India (Ramadass et al., 2018), and Poland (Cwirlej-Sozanska et al., 2018). Conversely, in the 75-85 age group, both males and females from both high and low socio-economic groups generally experience lower physical health (Rockwood & Howlett, 2019). Nevertheless, conflicting research findings are also evident in countries like Indonesia (Gondodiputro et al., 2018), Brazil (Hargreaves et al., 2021) and West Java (Vinsalia & Handajani, 2021).

This study sheds light on the intricate dynamics shaping the QoL among elderly individuals. By considering factors such as gender, age, socio-economic status, environment, enjoyment, life satisfaction, and physical health, a comprehensive understanding of well-being in older age emerges. Cultural nuances, societal expectations, and individual coping mechanisms further influence perceptions of QoL, highlighting the importance of adopting a holistic research approach.

Conclusions:

The 75-85 age group, representing the oldest segment of both male and female populations, is of significant importance in Thai society due to various contributing factors. This demographic may experience increased susceptibility to health issues, emphasizing the importance of ensuring access to healthcare and appropriate treatments to preserve their QoL. Changes in health status or social environment can influence happiness and satisfaction levels, underscoring the need for engaging in fulfilling activities and building robust support systems. Proactive measures

to address age-related concerns, such as chronic diseases, and fostering strong social connections are crucial for enhancing overall QoL in this age group. Tailored support efforts should encompass healthcare, understanding changing perceptions of happiness, preparation for increased care requirements, and fostering strong social connections. This proactive approach not only benefits the well-being of the elderly but also prepares for the challenges posed by an aging population in the future.

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References

- Alavi, M., Visentin, D. C., Thapa, D. K., Hunt, G. E., Watson, R., & Cleary, M. (2020). Chi-square for model fit in confirmatory factor analysis. *Journal of advanced nursing*, 76(9), 2209-2211.
- Biagini, A., Bastiani, L., & Sebastiani, L. (2022). The impact of physical activity on the quality of life of a sample of Italian people with physical disability. *Frontiers in sports and active living*, 4, 884074.
- Carmel, S. (2019). Health and well-being in late life: Gender differences worldwide. *Frontiers in medicine*, 6, 218.
- Cwirlej-Sozanska, A., Sozanski, B., Wisniowska-Szurlej, A., & Wilmowska-Pietruszynska, A. (2018). Quality of life and related factors among older people living in rural areas in south-eastern Poland. *Annals of Agricultural and Environmental Medicine*, 25(3).
- Eliasi, L. G., Rasi, H. A., & Tavakoli, A. (2017). Factors affecting quality of life among elderly population in iran. *Diabetes*, 5, 26-30.

- Faronbi, J. O., & Olaogun, A. A. (2017). The influence of caregivers' burden on the quality of life for caregivers of older adults with chronic illness in Nigeria. *International psychogeriatrics*, 29(7), 1085-1093.
- Galassi, F., Merizzi, A., D'Amen, B., & Santini, S. (2022). Creativity and art therapies to promote healthy aging: A scoping review. *Frontiers in Psychology*, 13, 906191.
- Gobbens, R. J., & Remmen, R. (2019). The effects of sociodemographic factors on quality of life among people aged 50 years or older are not unequivocal: comparing SF-12, WHOQOL-BREF, and WHOQOL-OLD. *Clinical interventions in aging*, 231-239.
- Gondodiputro, S., Hidayati, A. R., & Rahmiati, L. (2018). Gender, age, marital status, and education as predictors to quality of life in elderly: WHOQOL-BREF Indonesian Version. *International Journal of Integrated Health Sciences*, 6(1), 36-41.
- Goretzko, D., Pham, T. T. H., & Bühner, M. (2021). Exploratory factor analysis: Current use, methodological developments and recommendations for good practice. *Current psychology*, 40, 3510-3521.
- Hargreaves, S. M., Nakano, E. Y., Han, H., Raposo, A., Ariza-Montes, A., Vega-Muñoz, A., & Zandonadi, R. P. (2021). Quality of life of brazilian vegetarians measured by the whoqol-bref: Influence of type of diet, motivation and sociodemographic data. *Nutrients*, 13(8), 2648.
- Lodhi, F. S., Montazeri, A., Nedjat, S., Mahmoodi, M., Farooq, U., Yaseri, M., ... & Holakouie-Naieni, K. (2019). Assessing the quality of life among Pakistani general population and their associated factors by using the World Health Organization's quality of life instrument (WHOQOL-BREF): a population based cross-sectional study. *Health and quality of life outcomes*, 17, 1-17.
- Ramadass, S., Rai, S. K., Gupta, S. K., Kant, S., Wadhwa, S., Sood, M., & Sreenivas, V. (2018). Prevalence of disability and its association with sociodemographic

- factors and quality of life in a rural adult population of northern India. *National Medical Journal of India*, 31(5).
- Resende Rodrigues, L., Santos Tavares, D., Aparecida Dias, F., Sousa Pegorari, M., Fiori Marchiori, G., & dos Santos Tavares, D. M. (2017). QUALITY OF LIFE OF ELDERLY PEOPLE OF THE COMMUNITY AND ASSOCIATED FACTORS. *Journal of Nursing UFPE/Revista de Enfermagem UFPE*, 3.
- Rétsági, E., Prémusz, V., Makai, A., Melczer, C., Betlehem, J., Lampek, K., ... & Hock, M. (2020). Association with subjective measured physical activity (GPAQ) and quality of life (WHOQoL-BREF) of ageing adults in Hungary, a cross-sectional study. *BMC Public Health*, 20, 1-11.
- Rockwood, K., & Howlett, S. E. (2019). Age-related deficit accumulation and the diseases of ageing. *Mechanisms of ageing and development*, 180, 107-116.
- Schultz, W. M., Kelli, H. M., Lisko, J. C., Varghese, T., Shen, J., Sandesara, P., ... & Sperling, L. S. (2018). Socioeconomic status and cardiovascular outcomes: challenges and interventions. *Circulation*, 137(20), 2166-2178.
- Shrestha, N. (2021). Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, 9(1), 4-11.
- Singh, A., Palaniyandi, S., Palaniyandi, A., & Gupta, V. (2022). Health related quality of life among rural elderly using WHOQOL-BREF in the most backward district of India. *Journal of Family Medicine and Primary Care*, 11(3), 1162-1168.
- Stathi, A., Western, M., De Koning, J., Perkin, O., & Withall, J. (2018). Implementing physical activity programmes for community-dwelling older people with early signs of physical frailty. *The Palgrave handbook of ageing and physical activity promotion*, 401-422.
- Statista Research Department. (2023). *Total population in Thailand from 2018 to 2028*. Retrieved 2024, January 9, from <https://www.statista.com/statistics/331889/totalpopulationof-thailand/>

- Tanski, W., Wójciga, J., & Jankowska-Polanska, B. (2021). Association between malnutrition and quality of life in elderly patients with rheumatoid arthritis. *Nutrients*, 13(4), 1259.
- Vinsalia, T., & Handajani, Y. S. (2021). Life satisfaction is the most significant determinant of quality of life in the elderly. *Universa Medicina*, 40(1), 14-21.
- World Health Organization. (2022). *Ageing and health*. Retrieved 2024, January 9, from <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>.
- World Health Organization. (2023). *WHOQOL: Measuring Quality of Life*. Retrieved 2024, January 9, from <https://www.who.int/tools/whoqol>
- Xiong, S. (2022). *The Relationship Between Childhood Trauma, Cultural Values, Quality of Life, and Psychological Well-Being Among Hmong Adults in the United States* (Doctoral dissertation, Alliant International University).

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