# Measuring the Quality of Life and Determinants of the Urban Elderly: A Subjective Perspective

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*Abstract*—This study aims to measure the quality of life in the elderly and analyze the determinant of quality of life in an urban area. The study was conducted on 401 elderly who lived in 20 Kelurahan (sub-subdistrict) in the urban area of Medan City, North Sumatera, Indonesia. Quality of life (QoL) was measured using translated OPQOL-35. Whereas to find out determinant of the quality of life in elderly and predict it is done by ordinal regression analysis. The study discovered that elderly in an urban area have medium QoL (mean score is 72,04). The results showed that the two lowest QoL domain scores of the elderly are the financial circumstances domain (62.78), and the health domain (63.49). Meanwhile, the two highest QoL domain scores of the elderly care home and neighbor domain (81.3) and social relationship domain (80.06). Furthermore, ordinal regression analysis showed that the social demographic variables which determine of QOL of elderly in urban areas are 1) Overall Quality of Life Perception; 2) Marital Status; 3) Health Status; 4) Level of Education; 5) Proximity of house with family; 6) Using the telephone for communicating; 7) Involved in community activities, and 8) Know neighbors. All independent variables are significant in p-value < 0.05 and p-value < 0.01.

*Keywords— elderly, quality of life, social-demographic variables, OPQOL-35, determinant of quality of life, urban area*

## I. Introduction

Globally, Indonesia has the 5th largest elderly population in the world. In 2020, there were nearly 23.4 million older people, or 9,03 percent of the total population. Life expectancy has increased dramatically, from 45 in 1970 to 69.59 for males and 73,46 for women in 2020. At the same time, the birth rate has declined, resulting in an aging population. It is estimated that by the year 2035, the aging population in Indonesia will reach 15 percent of the total population [1].

Currently, governments across the developed country are concerned with enabling older people to maintain their active contribution to society and thereby their quality of life (QoL). But, QoL measurement has not been widely performed in Indonesia. QoL has become a commonly used endpoint in the evaluation of multisector public policy, including health, social, community, and environmental policy action [2]. The quality of life measurement in the elderly becomes important to be able to see the welfare and independence of the elderly.

QoL is an individual subjective evaluation or measurement of his/her life which does not only relate to disease symptoms or diseases but also the impact of those diseases or conditions on QoL, both holistically and multidimensionally. With the above definition of QOL, it should not be simply comprehended as "health conditions", "lifestyle", "the pleasure of life", "mental state", or "happiness". The social indicator experts state that objective measurement of social indicators is not quite appropriate for the elderly because older people have unique characteristics in terms of psychology and feeling [3]. The quality of life of the elderly is an expression of the level of satisfaction or dissatisfaction an elderly person feels with various aspects of their life. The measurement of life satisfaction in the elderly is an important thing because the subjective measurement results can represent the true portrait of the elderly from the perspective of the elderly individual.

## II. Methods

The study was conducted on 401 people aged $\geqslant 60$ years old and able to communicate effectively. The sampling method used Probability Proportional to Size (PPS) which is 20 out of 146 Kelurahan (sub-subdistrict) in Medan City - the capital city of North Sumatera were selected. In selected *kelurahan*, 20 households that have members aged 60 and above will be selected purposely. The list of research sampling

frameworks was sourced from Family Data of BKKBN in 2015 in Medan City. The QoL measurement was performed by using the Indonesian Version of OPQOL-35 which consists of 35 questions and is divided into eight domains (see Tabel 1). The dependent variable is the result of the QoL measurement in index data conducted in the previous stage. The index of QoL of the elderly is divided into three classes based on the distribution of data. High QoL with score $\geqslant$ 75, medium QoL with score 69.5 -74.9, and low QoL with score < 69.5. To analyze the proportion differences of the respondents' characteristics, a chi-square test was performed.

Multicollinearity testing is carried out to find the effect of independent variables between one and another. It was found that the VIF values of each independent variable ranged from 1.07 to 1.39. Measurement of correlation using the McFadden approach. The equation of the ordinal Regression model used:

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_{04} + \beta_{14}D_{RQOL} + \beta_{24}D_{Age} + \beta_{34}D_{SEX} + \tag{1}$$
$$\beta_{44}D_{MARRIED} + \beta_{54}D_{HEALTH} + \beta_{64}D_{EDUC} + \beta_{74}D_{ECONOMY} +$$
$$\beta_{84}D_{INTERAKSI} + \beta_{94}D_{PHONE} + \beta_{104}D_{CLOSED} +$$
$$\beta_{114}D_{NEIGHB} + \beta_{124}D_{PARTC} + \varepsilon_4$$

$p_i$ = opportunities occur QoL of elderly in stage-i

i = (1= low), (2=medium), (3 =good)

$\beta$ = parameter

TABLE I.     DOMAINS AND NUMBER OF ITEM OPQOL-35

| No. | Domains | Number of items |
|---|---|---|
| 1 | Life overall | 4 |
| 2 | Health | 4 |
| 3 | Social relationship | 5 |
| 4 | Independence, control over life, freedom | 4 |
| 5 | Home and neigbourhood | 4 |
| 6 | Psychological and emotional well-being | 4 |
| 7 | Financial circumstances | 4 |
| 8 | Leisure and activities | 6 |
| Total | | 35 |

## III. RESULTS

### A. QoL of Elderly's Score

The survey of QoL of elderly in the Medan city was conducted on 401 elderly with an aged range of 60 years to 98 years. This study used several variables to see the different characteristics of respondents (see Tables 2). The result showed that by cutting points at 68 years, the number of elderly under or equal to 68 years and beyond 68 years is almost the same. But the elderly who are under aged or equal to 68 years have a higher QoL than older elderly.

The number of female elderly are more than male elderly. Their quality of life is also slightly higher than male respondents (female = 72.1 and male = 71.9). Meanwhile, based on marital status, the elderly who are married have a better quality of life than those who are not married. This fact was also confirmed by the findings on the living arrangement variable. The elderly who had the highest quality of life are elderly who lived with their spouses. Another interesting finding from the elderly QoL measurement is QoL of elderly who are still working (73.7) is better than the QoL of elderly who do not work (71.3).

The results of frequency calculations showed that the education level of 58.6 percent of elderly in urban areas is low (graduating from elementary school or below). Meanwhile, the results of the QoL scores proved that the higher the level of education, the greater the average QoL score of the elderly. The elderly who are not migrants are proven to have a better average QoL score than the elderly who are migrant status. This research also proved that quality of life correlated with the health status of the elderly. The better status of elderly health, the higher quality of life in the elderly.

Furthermore, we will discuss the results of QoL calculations based on domains. This study divides QoL into three categories, namely high QoL with a score $\geqslant$ 75, medium QoL with a score of 69.5 -74.9, and low QoL with a score < 69.5. Table 3 showed that the three lowest domains are the Financial circumstances domain (62.78), health domain (63.49), and Independence, control over life, freedom domain (67.22).

TABLE II.     RESPONDENTS' CHARACTERISTICS DISTRIBUTION BASED ON AGE, SEX, MARITAL STATUS, LIVING ARRANGEMENT, DAILY ACTIVITIES, LIFETIME MIGRATION STATUS, AND HEALTH STATUS

| Characteristics | N | % | QL Index | | Mean Value test |
|---|---|---|---|---|---|
| | | | Mean | Med | P-value |
| Age (years) | | | | | 0.060 |
| ≤ 68 year | 198 | 49.4 | 73.3 | 73.7 | |
| > 68 year | 203 | 50.6 | 70.8 | 70.9 | |
| Sex | | | | | 0.728 |
| Male | 137 | 34 | 71.9 | 73.1 | |
| Female | 264 | 66 | 72.1 | 72 | |
| Marital Status | | | | | 0.000 |
| Married | 156 | 38.9 | 74.32 | 74.57 | |

| | | | | | |
|---|---|---|---|---|---|
| Unmarried | 245 | 61.1 | 70.6 | 70.86 | |
| Level of Education | | | | | 0.000 |
| Graduate high school and above | 96 | 23.9 | 75.29 | 74.86 | |
| Graduate junior high school and above | 70 | 17.5 | 71.48 | 73.14 | |
| Graduate elementary school and below | 235 | 58.6 | 70.89 | 70.86 | |
| Living Arrangement | | | | | 0.056 |
| Living alone | 34 | 8.5 | 72.4 | 72.3 | |
| Living with spouse | 38 | 9.5 | 74.3 | 74.9 | |
| Living with 1 generation | 100 | 24.9 | 72.8 | 73.7 | |
| Living with 2 generation and more | 224 | 55.9 | 71.4 | 71.4 | |
| Living with others | 5 | 1.2 | 67.2 | 69.1 | |
| Daily Activities | | | | | 0.000 |
| Working | 123 | 30.7 | 73.7 | 73.7 | |
| Not working | 278 | 69.3 | 71.3 | 71.4 | |
| Lifetime migration status | | | | | 0.110 |
| Migran | 211 | 53 | 68.6 | 69.1 | |
| Non migran | 190 | 47 | 72.1 | 72.6 | |
| Health Status | | | | | 0.000 |
| Good | 90 | 22.4 | 75.14 | 75.43 | |
| Not really good | 84 | 20.9 | 72.69 | 73.71 | |
| Bad | 227 | 56.6 | 70.58 | 70.86 | |

Meanwhile, the highest QoL domain for the elderly is the home and neighbor domain (81.3) and the social relationship domain (80.06). When the averages total QoL is calculated in the elderly, it can be concluded that the QoL of the elderly in the urban area is classified as medium (72.04). The median number of 72.57 (almost the same as the average number) shows the normal distribution of values.

TABLE III.    THE MEAN, MEDIAN, MINIMUM, AND MAXIMUM SCORES BY DOMAIN OF QOL OF ELDERLY

| No. | Domains | Mean | Med | Min | Max |
|---|---|---|---|---|---|
| 1. | Life overall | 72.12 | 70 | 35 | 100 |
| 2. | Health | 63.49 | 65 | 20 | 100 |
| 3. | Social relationship | 80.06 | 80 | 48 | 100 |
| 4. | Independence, control over life, freedom | 67.22 | 70 | 30 | 100 |
| 5. | Home and neighborhood | 81.3 | 80 | 40 | 100 |
| 6. | Psychological and emotional | 72.37 | 75 | 40 | 100 |
| 7. | Financial circumstances | 62.78 | 65 | 25 | 100 |
| 8. | Leisure and activities | 74.02 | 73.33 | 40 | 100 |
| | Total INDEX | 72.04 | 72.57 | 41.71 | 91.43 |

*B.  Regression Ordinal Analysis Result*

Ordinal regression analysis results showed that the selected independent variables have a significant effect on the QoL of the elderly (see Table 4). Through model test value, namely R-square Mcfadden = 0.258 and Nagelkerke R-square value = 0.487 which states that the model can explain 48.7 percent of the QoL of the elderly. Although not all independent variables in the model give significant results at a 5% confidence level. However, the model is appropriate to see the determinants of the QoL of the elderly.

The Overall QoL perception variable is how the elderly rate the quality of life as a whole. The elderly who has a medium/neutral perception about their quality of life as a whole tend to have a 3.14 times lower chance than the elderly who have a good perception (OR = 3.14; CI95% = 3.14 - 43.29). Then, the elderly who has a bad perception about their quality of life as a whole tend to have a 15.27 times lower chance than the elderly who have a good perception (OR =15.27; CI95% =15.27 - 213.15). A good perception of something will tend to make something good also.

Marital status means the ownership of a spouse is one of the factors that influence the QoL of the elderly. Married elderly tend to have a probability of 1.10 times greater than unmarried elderly (OR = 1.10; CI95% = 1.10 - 2.95). Gee (2000) in his research also stated that widow status for elderly women will affect the quality of life. The absence of a life partner for the elderly will tend to reduce their happiness.

The good healthy elderly people tend to have a good probability of QoL 1.28 times greater than bad healthy elderly (CI95% = 1.28 - 3.69). The declining health status of the elderly will reduce the probability of QoL

for the elderly. Nudes (2014) also states that health status is a factor that influences the QoL of the elderly with a linear relationship.

The level of education has a positive relationship to the QoL of the elderly. The low level of education of the elderly will reduce their quality of life. The elderly who have graduated from elementary school or lower tend to have a 0.26 times lower chance than the elderly who have graduated from high school and above (CI95% = 0.26 - 0.82). The same thing also happened for the elderly who graduated from junior high school had a 0.17 times lower chance of being compared to the elderly with higher education (95% CI = 0.17 - 0.63). The increasing levels of education were followed by high QoL for the elderly [4].

TABLE IV.    ORDINAL REGRESSION OF PREDICTORS OF QOL

| Variables | B | OR | CI (95%) |
|---|---|---|---|
| *Y= QOL* | | | |
| Good (ref) | | | |
| Medium | 6.54*** | 135.78 | (135.78 -3.551.05) |
| Bad | 4.28*** | 15.17 | (15.17 - 341.72) |
| *Overall Quality of Life Perception* | | | |
| Good (ref) | | | |
| Medium | -2.46*** | 3.14 | (3.14 - 43.29) |
| Bad | -4.04*** | 15.27 | (15.27 - 213.15) |
| *Age* | | | |
| >68 (ref) | | | |
| ≤ 68 year | 0.41 | 0.97 | (0.97 - 2.32) |
| *Sex* | | | |
| Female (ref) | | | |
| Male | -0.11 | 0.54 | (0.54 - 1.46) |
| *Marital Status* | | | |
| Unmarried (ref) | | | |
| Married | 0.59** | 1.10 | (1.10 - 2.95) |
| *Health Status* | | | |
| Bad is having 2 diseases or more (ref) | | | |
| Not good is having 1 disease | 0.32 | 0.81 | (0.81 - 2.35) |
| Good is having no disease | 0.77*** | 1.28 | (1.28 - 3.69) |
| *Level of Education* | | | |
| graduated high school and above (ref) | | | |
| graduated junior high school | -1.13*** | 0.17 | (0.17 - 0.63) |
| graduated elementary school and below | -0.77*** | 0.26 | (0.26 - 0.82) |
| *Independence of economic* | | | |
| independent (ref) | | | |
| Not independent | -0.36 | 0.45 | (0.45 - 1.08) |
| *Family Interaction* | | | |
| seldom (ref) | | | |
| often | 0.35 | 0.87 | (0.87 - 2.31) |
| *The proximity of house with family* | | | |
| far (ref) | | | |
| closed | 0.60*** | 1.17 | (1.17 - 2.83) |
| *Using the telephone for communicating* | | | |
| seldom (ref) | | | |
| often | 0.80*** | 1.42 | (1.42 - 3.50) |
| *Involved in community activities* | | | |
| Not involved (ref) | | | |
| Involved in 1 activity | 1.08*** | 1.80 | (1.80 - 4.81) |
| Involved in 2 activities | 0.90*** | 1.42 | (1.42 - 4.28) |

| Know neighbors | | | |
|---|---|---|---|
| Not all know (ref) | | | |
| know almost all neighbors | 1.08*** | 1.65 | (1.65 - 5.26) |

Communicating by telephone could strengthen relations between the elderly and their families. Telephone communication is an appropriate strategy to maintain family relationships despite the distance apart. The increasing frequency of communicating elderly by telephone with family gives a positive influence on the QoL of the elderly (OR = 1.42; 95% CI = 1.42 - 3.50).

Lakshmi and Roopa stated that geographical proximity influences the solidarity relations between generations in elderly families [5]. The existence of children who are geographically closed to the elderly gives comfort and serenity to the elderly. Settlement patterns in some subdistricts in Medan City are clustered. We can find the house of elderly and their children's houses are within the large yard. The elderly with the characteristics of living near with their children and siblings have an opportunity to improve their quality of life 1.17 times from the elderly who live far away from their families (OR = 1.17; 95% CI = 1.17 - 2.83).

The survey results stated that more than 70 percent of the elderly know almost all neighbors around the house, and only 3.2 percent know only one family in their neighborhood. This fact illustrates that the elderly in Medan City are quite close with the surrounding society. The result showed that the elderly who knows almost all neighbors around them has the opportunity of increasing 1.65 times the quality of life better than not knowing neighbors (OR 1.65; 95% CI = 1.65 - 5.26). Getting closer emotionally to society has a positive influence on the QOL of the elderly.

Khan and Tahir stated that activeness in social activities is a kind of social support that affects the emotional, physical and spiritual of the elderly [4]. The results of the analysis showed that the elderly involved in one community activity had a good chance of quality of life 1.80 times compared to the elderly who were not active in the community (OR = 1.80, CI95% = 1.80 - 4.81). Thus, the relationship between the level of participation of the elderly in society and the quality of life of the elderly has a positive relationship with an error rate of 1%. Whereas the elderly with two community activities had a better chance of quality of life 1.42 times compared to those who were not active (OR = 1.42; 95% CI = 1.42 - 4.28).

## IV. DISCUSSION

In general, the QoL of elderly in an urban area, Medan City based on all OPQOL-35 domains is classified as medium (score 72.04). The two lowest QoL domain scores are financial (62.78) and health domain (63.49). This result confirms the descriptive analysis related to the economic conditions of the elderly in Medan City which are not economically empowered. For the elderly who still working, their average income is still below the Medan City regional minimum wages. This is also in line with fact that the majority elderly have health insurance that is borne by the government. Also, the finding of low scores in the health domain needs attention by widening access to health services for the elderly.

Meanwhile, the two highest QoL domain scores are the home and neighbor domain (81.3) and the social relationship domain (80.06). Actually, this result reflects the portrait of culture in Indonesia where kinship is one of the capital in a person's life. Elderly feel safe and comfortable when living surrounding of their family, neighbors, and friends. The elderly who live and mingle with their community have a better quality of life than the elderly who are not close to their social environment [5].

The ordinal regression results showed that several social-demographic variables are proven to affect the QoL of the elderly. So, based on level of scope, the variables can be grouped into three kinds of factors, namely 1) individuality factor; 2) family factors and 3) social interaction factors.

The individual factor is a variable that is inherent in an elderly individual. The individual factors consist of overall QoL perception, health status, level of education and marital status. Another factor that can influence QoL is elderly stereotyping. Stereotype also determines the way the elderly perceives themselves and how they see their whole life [6]. Cultural and educational factors, as well as health conditions, can contribute to the QoL [7]. Marital status significantly relates to mental health. Persons who still have a spouse showed better mental health when compared to those without a spouse [8].

The family roles reflect the relationship between the elderly and their family members. Kim and Kim stated that the quality of life of the elderly would be better if the elderly lived with their generation where they gave and received benefits in terms of care and assistance in their daily lives [9]. Some variables related to the family such the economic dependency of the family, frequent interactions with family, frequent communication via telephone with family members, proximity to family members. The significant proven variables in family factors are the proximity of the elderly's house with family and using the telephone for communicating with family. Family is an important and main factor that influences the lives of the elderly [9-11].

Currently, the advancement of communication technology makes distance and time are no longer a

barrier to the emotional connection between family members. Bengston stated that geographical proximity influences the form of solidarity relations between generations in elderly families [12].

The last, the social interaction factor is anything about interactions and activities of the elderly in the social community. The significant proven variables in social interaction factors are involved in community activities and knowing neighbors. A study conducted by Pei et al described that participation in social activities becomes a key to successfully achieving good QoL [13]. Bowling et al. stated that involvement in social activities is one of the factors that have a positive influence on improving the QoL of the elderly [14]. In terms of Indonesian culture, the neighbors and friends are the social capital who can be resources for living. Variables that have proven to significantly affect the QoL of the elderly in an urban areas can be used as a basis in formulating policies to improve the quality of life of the elderly.

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