# Measurement of Health Related Quality of Lifein General Population in Indonesia usingEQ-5D-5L with Online Survey

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**ABSTRACT**

**Purpose:Measuring the health related quality of life (HRQOL) for the community is very important in an effort to realize a health intervention to improve the quality of life of people in Indonesia. Information regarding HRQOL of people in Indonesia is still limited. Furthermore HRQOL of Indonesian population measured using EQ-5D-5L has not been done much in Indonesia.This study aimedto examine differences of HRQOLbased on the characteristics of general population in Indonesia using online survey methods.Methods:A cross-sectional study was carried out with online survey methods in the general population in Indonesia usingEQ-5D-5L instrument. Data was collected using snowball sampling technique and finally 1,170 respondents were recruited from 34 provinces of Indonesia. Results: Sixty three percent of respondents reported no problems in all dimensions of EQ-5D-5L descriptive system. The most frequent problem reported by respondnets was the dimension of anxiety/depression (30%) and followed by the dimension of pain/discomfort (21.1%), usual activities (4%), mobility (3.7%)and self-care (1.1%). The mean health utility was 0.9420±0.0981, menawhile the mean of VAS was 88.94±40.83. There were significant differences of health utility based on characteristics of age (p = 0.000), education level (p = 0.000), marital status (p = 0.001) and health problem (0.027).Conclusion: This study provides information regarding HRQOL of general population of Indonesia that might be used to estimate health disutility due to specific diseases given the health utility information of such diseases.**

**Keywords:** HRQOL,General Population, EQ-5D-5L,OnlineSurvey, Indonesia

## INTRODUCTION

Health related quality of life (HRQOL) measurement is very importantto see the level of health or improvement of public health status comprehensively. HRQOL is an outcome from a professional perspective that is related to perceptions of health, feeling comfortable, and functional abilities. HRQOL assessments must be based on the patient's own report and must include the relevant domain of the patient's daily (mental, physical and social) abilities [1].HRQOL could be measured using generic or specific instrument based on the purpose of measurement. The generic instrument presents HRQOL in terms of health profile and/or health utility (utility) [2]. Utility is important in economic evaluation/pharmacoeconomic studies because they are needed to calculate quality of adjusted life years (QALY), whic is an outcome used in cost utility analysis, one of method in pharmacoeconomic/economic evaluation study [3].The generic instrument that can be used to measure health utility are for instances the EuroQoL 5-Dimension (EQ-5D) questionnaire [4], Short Form-6 Dimension (SF-6D) [5], and Mark 2 and Mark 3 Health Utility Index (HUI2/3) [6]. In addition, standard gamble, time trade off and EQ-5D are the most widely used instruments to measure utility [7].

Two versions of the EQ-5D questionnaire are available: EQ-5D-3L (old version) and EQ-5D-5L (latest version). EQ-5D consists of two parts: EQ-5D descriptive system and EQ-5D visual analog scale(EQ-VAS).EQ-5D descriptive system measures health status using 5 domains of quality of life including mobility, self-care, usual activity, pain/discomfort, and anxiety/depression. The results of EQ-5D measurements are indicated by a health profile or health status. The EQ-5D-5L descriptive system provides 5 possible response categories. For example, mobility domain has5 responsesnamely: no problems (level 1), or slight problem (level 2), or moderate problem (level 3), or severe problems (level 4), or unable to walk/extreme problems (level 5). The EQ-VAS records the respondent's assessment of his health by using a visual analog scale which is a vertical line with a scale from 0 to 100. The end point (100) indicate the best health status imagined and the starting point (0) indicate the worst health status imagined..Utility generally range from 0 (death) to 1 (perfect health). The value is converted from EQ-5D descriptive system responses using a value set that specific for each country [8].

To the best of our knowledge, this is the first study for evaluating HRQOLof general population in Indonesia using EQ-5D-5L with online survey method.Previous study has been conducted to measure HRQOL of general population in Indonesia using EQ-5D-5Lwith face-to-face interview method [9].The aims of this study was to examine HRQOL of general population in Indonesia and whether there are differences in HRQOLbased on characteristics of respondents using online survey method.

## METHODS

### Study participants

The study was a cross-sectional study usingnonprobability sampling namely Snowball sampling technique. One thousand and one hundred seventy respondents were recruited from 34 provinces of Indonesia in the period July-September 2018.The inclusion criteria was range of age from 18 to 65 years old.

### Instrument

We used the EQ-5D-5L instrument inBahasa Indonesia language version that has been developed by EuroQoL group[8]. Utility values were calculated using the Indonesian value set [10]. In addition, information regarding patients characteristics were also collected including age, sex, education level, employment status, and marital status.

### Data collection

We used the snowball sampling technique to distribute questionnaires using online method. SurveyMonkey® application was used to help data collection. Link apps were shared to 1-2 respondents in each province to distribute more to other respondents in the same province of each respondent. For example, a questionnaire link was given to respondent A from S province, then respondent A was asked to distribute the questionnaire link to other 5 respondents who were domiciled with the respondent. Each respondent then fullfil the questionnaire by self-administering.

### Statistical analysis

In this study, descriptive frequency analysis was used to analyze the description of respondents characteristics. Kolmogorov-Smirnov test was performed to analyzedistribution of the data and for further select the appropriate statistic test.Independent t-test was used to test the difference of utility based on different groups in each respondents characteristic.Correlation and regression tests were used to show the contribution ofrespondents characteristics in influencing HRQOL. All statictical analysis used SPSS version 23.0.

### Ethical Clearance

The study gained the ethical approval from the Medical and Health Research Ethics Committee (MHREC) of Faculty of Medicine, Universitas GadjahMada, Indonesia with the reference number: KE/FK/0472/EC/2018.

## RESULT

### Participants

The majority of respondents were female(68.5%). The mean age of respondents in this study was 29.83±9.67 years old. Most of the respondents was single(60.7%). Most of respondentshad education level higher thanhigh school (88,8%). Mostof respondentswas employed (82.1%). Ninety point eight percent of respondents had high income above IDR 3,000,000 and73.4%of respondents also had high expenditure, which is above IDR 2,000,000. Most of respondentshadhealth insurance (71.5%).Mostof respondents did not have health problems (74.3%).Characteristics of respondents are presented in Table 1.

### Health State

The results obtained from 1,170 respondents mostly reported no problems in all domains (62.8%). In this study, here were no reported of “extreme problems” for any of the domain, except 1 respondent in the domain of anxiety.The most problem was reported for anxiety/depression (29.4%) and followed by pain/discomfort (21.1%), usual activity (4%), mobility (3.7%), and self-care (1.1%). The frequencies of item responses to problems among five dimension in general population in Indonesia are presented in Table 2.

In this study, there were 30 varying health states, utility value were range from 0.358 – 1. Table 3 shows majority of 62.8% respondents were reported has a perfect health state (11111) which means the respondents reported be healthy and there are no problems in the domain of mobility, self-care, usual activity, not feeling pain/discomfort and not feeling anxious/depression. Point two percent (0.2%) of respondents had the lowest health state (33223) which means the respondents reported having problems in several domains.

### EQ-5D score and VAS score

The description of utility, VAS, and differences of utility scores based onrespondent characteristicsare summarized in Table 4. The mean utility was 0.9429 (SD=0.0976), meanwhile the mean VAS score was 88.94 (SD=40.83). The utility score was higher than VAS score. Result of independent t-test, four variables of respondents characteristicswhich were age, education level, marital status, and health problems were found to be

statistically significant ($p<0.05$). In this study, increasing of age affectedutility ($p=0.000$). Respondents with higher level of education had better utility ($p=0.000$). Respondents with single status had better utility than those who were married which were 0.9501±0.0819 versus 0.9319±0.1170($p=0.002$). The mean utility and VAS score were lower in patients with health problems than those who did not have health problems which were0.9329±0.1056 versus0.9463±0.0946($p=0.042$). Respondents who were young, high education level, single, and dont have health problems got a higher utility.

**Multivariate regression result**

Table 5 describes the correlation and regression test results between the characteristics of respondents and utility. Results of correlation test showed that characteristics of age, educational level, marital status, and health problems were significantly correlate with utility. Result of multivariate regression test showed that two variables ofrespondent characteristics which were age and educational level were significantly contribute to utility ofgeneral population in Indonesia. The coefficient of determination $R^2$ (R square) obtained in this study is 0.043, indicated that respondents characteristics gave contribution to utility as much as 4.3% only.

## DISCUSSION

The aims of this study was to evaluate HRQOL of general population in Indonesia and to examine whether there are differences in HRQOL based on characteristics of Indonesian people using online survey method. This is the first study using EQ-5D-5L which measures the quality of life of general populations in Indonesia with online survey methods. We recruited 1,170 respondents with a variety of different characteristics, including age, gender, level of education, employment status, marital status, income, expenses, health insurance and health problems.Specifically, this kind of study could be used to be linked to health administration data, to obtain more complete data that can be useful in tracking or monitoring public health problems, for health service planning, and can be used for strategy evaluation in efforts to prevent health problems [11].

There were some difficulties experienced by researchers in data collection, such as the desire of respondents to fill in online questionnaires, the level of non-response was higher in the online mode than in the face-to-face interview mode, more respondents but was difficult to give feedback [12]. Most of the respondents are those under the age of 30 years because that age makes respondents able and willing to use the internet in their daily lives. Several studies show that samples from online surveys tend to get younger age respondents [13].

Our study had a high number of respondents who reported no problems in all dimensions (health state 11111) (63%), and the remaining 37% reported have problems in various dimensions of the EQ-5D. Similar study was carried out in Italy and showed results similar to EQ-5D-5L, which most of respondents did not have problems in the dimensions of the EQ-5D-5L [11].In this study the dimensions of EQ-5D that were most felt/experienced by respondents were dimensions of anxiety/depression and dimensions of pain/discomfort. This result was different from previous study in Indonesia which stated that the EQ-5D dimensions that were felt most by healthy population respondents were dimensions of pain/discomfort (39.66%) and self-care dimensions (1.9%) [9].

The mean EQ-5D index score of this study was 0.942± 0.0981. This finding was slightly higher than previous study in which the mean utility was 0.91 ± 0.11[9], this could be due our respondents were relateviley younger than previous study. Finding of this study wasslightly lower thanfinding of the study conducted in healthy populations in South Korea, in which the utilityscore obtained was 0.96 [14]. Differences in utility scores can be caused by differences in perceptions of health across different ethnicities of the population. Another factor that causes differences in utility scores is the difference in value sets used to convert the health status into uitlity score[15].

This study found that sex, employment status, income, expenditure, and health insurance were not significantly affect utility score. Meanwhileage, education level, marital status,and health problemswere significantlyaffect the utility score. All characteristics were not significantly affect the VAS score. Other studies conducted in Denmark [16], South Brazil [17],and Australia [18]also found that the level of education also significantly affected the HRQOL.

This study has several limitation for intances the studyused online survey methods in which researchers cannot explain the questions directly to respondents, thus increasing the likelihood of confusion among respondents. Furthermore, this study used non-random sampling method as well as not matched the proportion of respondents characteristics based on the real situation of Indonesian general population characteristics.

## CONCLUSION

This is the first Indonesian study to measureHRQOL applying EQ-5D-5L usingonline survey methods.The finding from this study, 63% of respondents reported no problems in all dimensions. The mean utility was 0.942 ±0.0981, meanwhile the mean VAS score was 88.94 ±40.83.Age, education level, marital status and health problems of respondents in this study significantly affected utility.

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Table 1:Characteristics of respondents

| Characteristics | | N (1,170) | % |
|---|---|---|---|
| **Age (Mean ±SD) years old** | | 29.83± 9.666 | |
| **Age Category** | 18-25 years old | 502 | 42.9 |
| | 26-35 years old | 464 | 39.7 |
| | 36-45 years old | 89 | 7.6 |
| | 46-55 years old | 59 | 5.0 |
| | 56-65 years old | 56 | 4.8 |
| **Sex** | Male | 369 | 31.5 |
| | Female | 801 | 68.5 |
| **Educational level** | <High school | 131 | 11.2 |
| | > High school | 1039 | 88.8 |
| **Employment status** | Unemployed | 209 | 17.9 |
| | Employed | 961 | 82.1 |
| **Marital status** | Single | 710 | 60.7 |
| | Married | 460 | 39.3 |
| **Income** | Low (≤ IDR 3 million) | 108 | 9.2 |
| | High (≥ IDR 3 million) | 1062 | 90.8 |
| **Expenditure** | Low (≤ IDR 2 million) | 311 | 26.6 |
| | High (≥ IDR 2 million) | 859 | 73.4 |
| **Health Insurance** | No | 334 | 28.5 |
| | Yes | 836 | 71.5 |
| **Health Problem** | No | 869 | 74.3 |
| | Yes | 301 | 25.7 |

Table 2: Response to problems in EQ-5D dimensions

| Dimension | Level | | | | | | | | | | Having problem |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3 | | 4 | | 5 | | |
| | N | % | N | % | N | % | N | % | N | % | % |
| Mobility | 1126 | 96.2 | 13 | 1.1 | 31 | 2.6 | - | - | - | - | 3.7 |
| Self care | 1158 | 99 | 3 | 0.3 | 9 | 0.8 | - | - | - | - | 1.1 |
| Usual activity | 1123 | 96 | 42 | 3.6 | 5 | 0.4 | - | - | - | - | 4 |
| Pain/Discomfort | 921 | 78.9 | 229 | 19.3 | 20 | 1.8 | - | - | - | - | 21.1 |
| Anxiety/Depression | 828 | 69.8 | 267 | 23 | 75 | 7 | - | - | - | - | 30 |

Table 3: Most frequent health states with mean EQ-5D scores

| Health State | Number | Percents (%) | Utility |
|---|---|---|---|
| **11111** | 737 | 63 | 1 |
| **11112** | 114 | 9.7 | 0.8155 |
| **11113** | 49 | 4.2 | 0.6001 |
| **11121** | 70 | 6 | 0.8019 |
| **11122** | 95 | 8.1 | 0.6159 |
| **11123** | 15 | 1.3 | 0.7373 |
| **11125** | 1 | 0.1 | 0.2140 |
| **11131** | 2 | 0.2 | 0.6900 |
| **11132** | 15 | 1.3 | 0.7903 |
| **11211** | 4 | 0.3 | 0.9100 |
| **11212** | 5 | 0.4 | 0.7520 |
| **11213** | 2 | 0.2 | 0.7410 |
| **11221** | 5 | 0.4 | 0.7465 |
| **11222** | 9 | 0.8 | 0.7255 |
| **11232** | 1 | 0.1 | 0.3410 |
| **11311** | 2 | 0.2 | 0.8090 |
| **21112** | 6 | 0.5 | 0.4728 |
| **21121** | 4 | 0.3 | 0.7950 |
| **21122** | 3 | 0.3 | 0.4526 |
| **31121** | 2 | 0.2 | 0.5070 |
| **31122** | 9 | 0.8 | 0.6235 |
| **31221** | 2 | 0.2 | 0.5970 |
| **31223** | 3 | 0.3 | 0.4980 |
| **31312** | 3 | 0.3 | 0.1780 |
| **32223** | 3 | 0.3 | 0.3620 |
| **33122** | 1 | 0.1 | 0.5030 |
| **33123** | 1 | 0.1 | 0.4480 |
| **33222** | 4 | 0.3 | 0.0180 |
| **33223** | 2 | 0.2 | 0.2160 |
| **33232** | 1 | 0.1 | 0.0090 |

Table 4:Differences EQ-5D index score and VAS scorebased on the characteristics of the respondents

| Demographic characteristics | | EQ-5D index score | P-value | VAS score | P-value |
|---|---|---|---|---|---|
| **Total** | | 0.9420±0.0981 | | 88.94±40.83 | |
| **Gender** | Male | 0.9423 | 0.338 | 88.95 | 0.887 |
| | Female | 0.9424 | | 88.99 | |
| **Age category** | 18-25 | 0.9422 | 0.000* | 88.95 | 0.648 |
| | 26-35 | 0.9423 | | 88.95 | |
| | 36-45 | 0.9428 | | 89.01 | |
| | 46-55 | 0.9444 | | 89.06 | |
| | 56-65 | 0.9435 | | 89.01 | |
| **Educational level** | <High school | 0.9428 | 0.000* | 88.97 | 0.276 |
| | > High school | 0.9420 | | 88.94 | |
| **Employment status** | Unemployed | 0.9426 | 0.109 | 88.99 | 0.629 |
| | Employed | 0.9420 | | 88.94 | |
| **Marital status** | Single | 0.9423 | 0.001* | 88.95 | 0.590 |
| | Married | 0.9424 | | 88.99 | |
| **Income** | Low (≤ IDR 3 million) | 0.9430 | 0.500 | 88.98 | 0.650 |
| | High (> IDR 3 million) | 0.9422 | | 88.94 | |
| **Expenditure** | Low (≤ IDR 2 million) | 0.9424 | 0.495 | 88.96 | 0.740 |
| | High (> IDR 2 million) | 0.9420 | | 88.95 | |
| **Insurance** | No | 0.9426 | 0.609 | 89.00 | 0.823 |
| | Yes | 0.9420 | | 88.94 | |
| **Health problems** | No | 0.9427 | 0.027* | 89.01 | 0.163 |
| | Yes | 0.9420 | | 88.94 | |

Table 5:The correlation and regression test results between the characteristics of respondents and the EQ-5D

| Demographic characteristics | Correlation | | Regression | | |
|---|---|---|---|---|---|
| | r | p-value | B | p-value | $R^2$ |
| Gender | 0.026 | 0.379 | -0.001 | 0.913 | 0.043 |
| Age | -0.163** | 0.000 | -0.015 | 0.000* | |
| Educational level | 0.115** | 0.000 | 0.028 | 0.003* | |
| Employment status | 0.044 | 0.132 | 0.012 | 0.140 | |
| Marital status | -0.091** | 0.002 | -0.002 | 0.730 | |
| Income | 0.014 | 0.635 | 0.008 | 0.490 | |
| Expenditure | -0.020 | 0.499 | -0.008 | 0.308 | |
| Insurance | 0.017 | 0.553 | 0.007 | 0.266 | |
| Health problems | -0.059* | 0.042 | -0.010 | 0.142 | |

*significant at $p < 0.05$