# Assessing the impact of vision impairment on health-related quality of life among community-dwelling older population in Hong Kong: preliminary results

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## BACKGROUND

**Visual impairment(VI)** is known to have a negative influence on the health-related quality of life (HRQol). The main cause of VI is correctable refractive error, followed by pathological eye disorders that require further clinical intervention. It is still worthy to investigate how the different categories of VI, correctable (e.g. refractive errors) or uncorrectable (cataracts, macular degeneration, etc), affect HRQoL and what the magnitude of these effects are. This information is important when considering the implementation of public health interventions.

## PURPOSE

To clarify the relationship between VI and HRQoL in a community-dwelling elderly population in Hong Kong, in order to aid the construction of cost-utility decision models.

## METHODS

### Subjects & study design

- Received a community-based eye examination in 2015-17;
- Without referral to eye specialist at the examination.

Aged 50+

Age- and sex- stratification sampling

2022-2024

Eye examination

Questionnaire survey

### Measurements

**Table 1. Definition of VI (based on the better seeing eye)**

| Distance VI | Visual acuity (VA) |
|---|---|
| No VI | Presenting VA (PVA) equal to or better than 6/12 (WHO definition) |
| VI | |
| Correctable VI | PVA worse than 6/12, but best corrected VA (BCVA) equal to or better than 6/12 |
| Uncorrectable VI | PVA and BCVA worse than 6/12 |

HRQoL was measured using the Chinese version of **EQ-5D-5L** questionnaire. Health states defined by EQ-5D-5L were converted into the health utility score according to the **Hong Kong value set**, ranging from -0.864 for worst health to 1.0 for full health.[1]

### Statistical analysis

- **Chi-squared test** and **one-way ANOVA** were used to compare characteristics across VI groups;
- **Kruskal-Wallis test** and **ordinal least squares (OLS) model** were used to examine the association of VI and EQ-5D utility.

## RESULTS

Of the 999 older people who participated in this study, the mean age was 73.7 years and 47.5% were male. The overall prevalence of VI was 19.1% by person and was higher in older participants with lower education and income level (all $P$ <0.05).

**Table 2. Characteristic of the participants**

| Characteristic | Overall | No VI | Correctable VI | Uncorrectable VI | p-value |
|---|---|---|---|---|---|
| | 999 | 808 (80.9%) | 154 (15.4%) | 37 (3.7%) | |
| Mean age, years (SD) | 73.7 (5.2) | 73.2 (4.9) | 75.5 (5.7) | 78.0 (6.8) | <0.001[2] |
| Male Sex[1] | 474 (47.5%) | 385 (81.2%) | 70 (14.8%) | 19 (4.0%) | 0.779[3] |
| Education[1] | | | | | <0.001[3] |
| No Schooling/ Pre-primary | 68 (6.8%) | 44 (64.7%) | 16 (23.5%) | 8 (12.0%) | |
| Primary | 445 (44.6%) | 345 (77.5%) | 81 (18.2%) | 19 (4.3%) | |
| Secondary or above | 486 (48.6%) | 419 (86.2%) | 57 (11.7%) | 10 (2.1%) | |
| Monthly personal income level[1] | | | | | 0.012[3] |
| ≤$2000 | 100 (10.1%) | 83 (83.0%) | 12 (12.0%) | 5 (5.0%) | |
| $2,001-$5,000 | 525 (53.0%) | 409 (77.9%) | 89 (17.0%) | 27 (5.1%) | |
| >$5,000 | 367 (36.7%) | 309 (84.2%) | 53 (14.5%) | 5 (1.4%) | |
| Refused to answer | 7 | 7 | 0 | 0 | |
| Any self-reported HT or DM[1] | 562 (56.3%) | 445 (79.2%) | 92 (16.4%) | 25 (4.5%) | 0.208[3] |

[1]n (%); [2]One-way ANOVA; [3]Pearson's Chi-squared test; Fisher's exact test

Utility scores were significantly different across VI groups ($P$<0.05), **0.91 for those without VI, 0.90 for correctable VI and 0.85 for uncorrectable VI**. Compared to participants without VI, those with VI were more likely to report problems with mobility and self-care ($P$<0.05).

**Table 3. Comparison of EQ-5D among different VI status**

| EQ-5D | No VI | Correctable VI | Uncorrectable VI | p-value |
|---|---|---|---|---|
| EQ-5D utility scores | | | | 0.042[2] |
| Mean (SD) | 0.91 (0.15) | 0.90 (0.12) | 0.85 (0.22) | |
| Median (IQR) | 0.93 (0.86, 1.00) | 0.92 (0.85, 1.00) | 0.92 (0.82, 1.00) | |
| EQ-5D health problems (with problem)[1] | | | | |
| Mobility | 134 (16.6%) | 41 (26.6%) | 11 (29.7%) | 0.003[3] |
| Self-care | 19 (2.4%) | 5 (3.2%) | 5 (13.5%) | 0.004[3] |
| Usual activities | 52 (6.4%) | 13 (8.4%) | 5 (13.5%) | 0.172[3] |
| Pain/discomfort | 313 (38.7%) | 70 (45.5%) | 18 (48.7%) | 0.166[3] |
| Anxiety/depression | 140 (17.3%) | 20 (13.0%) | 4 (10.8%) | 0.265[3] |

[1]n (%); [2]Kruskal-Wallis test; [3]Chi-squared test

After adjustment for covariates, participants with VI had lower utility scores compared to those without VI. **The magnitude was 0.003 and 0.046 for correctable and uncorrectable VI** respectively, though neither were statistically significant.

**Table 4. Association between VI and EQ-5D utility scores**

| VI status | β | 95% CI | p-value |
|---|---|---|---|
| No VI (reference) | | | |
| Correctable VI | -0.003 | -0.03, 0.02 | 0.832 |
| Uncorrectable VI | -0.046 | -0.09, 0.003 | 0.066 |

Adjusted for age, sex, social economic status (education and income), and any self-reported hypertension or diabetes.

## CONCLUSION

Elderly with VI, especially uncorrectable VI, tended to have lower EQ-5D utility scores, and more likely to have problems with mobility and self-care, compared with those free of VI.

- The EQ-5D disutility of uncorrectable VI was 0.05, consistent with the range of 0.04-0.06 for age-related eye disorders in a previous meta-analysis. [2]

**Limitations**: We only used distance VA as a measure of VI. The sample had a less severe visual status profile. As a result, the disutility values of VI may be underestimated.

**References**

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