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Original Article

A comparison of health-related quality of life using the World Health Organization Quality of Life–BREF and 5-Level EuroQol-5 Dimensions in the Malaysian population

Andrian Liem[1,2], **Hui Jun Chih**[3], **Vithya Velaithan**[4,5], **Richard Norman**[3], **Daniel Reidpath**[6], **Tin Tin Su**[1,4]

[1]Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Subang Jaya, Malaysia
[2]Faculty of Psychology, Universitas Sebelas Maret, Surakarta, Indonesia
[3]School of Population Health, Curtin University, Perth, Australia
[4]South East Asia Community Observatory, Monash University Malaysia, Subang Jaya, Malaysia
[5]School of Information Technology, Monash University Malaysia, Subang Jaya, Malaysia
[6]Institute for Global Health and Development, Queen Margaret University, Edinburgh, UK

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Corresponding author:
Andrian Liem
Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Subang Jaya, Selangor 47500, Malaysia
E-mail: andrian.liem@monash.edu

Co-Corresponding author:
Tin Tin Su
Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Subang Jaya, Selangor 47500, Malaysia
E-mail: tintin.su@monash.edu

ABSTRACT

Objectives: This study aimed to describe and compare health-related quality of life (QoL) as measured by the World Health Organization Quality of Life–BREF (WHOQoL-BREF) and the EuroQol-5 Dimensions (EQ-5D) among the Malaysian population, examining differences by sociodemographic characteristics including age, income, sex, ethnicity, educational level, and occupation.
Methods: This cross-sectional study used data from 19,402 individuals collected as part of a health and demographic surveillance system survey conducted in the Segamat district of Malaysia in 2018–2019. Descriptive statistics and measures of central tendency were produced. Differences in QoL among demographic sub-groups were examined using the t-test and analysis of variance, while the correlations between the WHOQoL-BREF and EQ-5D were evaluated using Pearson correlation coefficients.
Results: Based on complete case analysis (n=19,129), the average scores for the 4 WHOQoL-BREF domains were 28.2 (physical), 24.1 (psychological), 12.0 (social relationships), and 30.4 (environment). The percentages of participants not in full health for each EQ-5D dimension were 12.8% (mobility), 3.1% (self-care), 6.9% (usual activities), 20.9% (pain/discomfort), and 6.8% (anxiety/depression). Correlations between the 4 WHOQoL-BREF domains and the 5 EQ-5D dimensions were relatively weak, ranging from −0.06 (social relationships with self-care and pain/discomfort; p<0.001) to −0.42 (physical with mobility; p<0.001).
Conclusion: Although health-related QoL as measured by the WHOQoL-BREF and the EQ-5D are correlated, these 2 measures should not be considered interchangeable. The choice between them should be guided by the specific research questions and the intended use of the data.

Keywords: Community participation; Developing countries; Health inequities; Quality of life; Surveys and questionnaires

Introduction

The World Health Organization (WHO) defines quality of life (QoL) as an individual's perception of their position in life within the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns [1]. This broad concept encompasses multiple layers of an individual's life, including physical health, psychological state, social relationships, and interactions with the surrounding environment. When QoL is applied to the measurement of health status and disease, it is termed health-related QoL, reflecting subjective health, well-being, and life satisfaction among the population [2].

Several instruments are widely used to measure health-related QoL, 2 of which are the focus of this study. The first is the WHO Quality of Life Scale–BREF (WHOQoL-BREF) [1], which assesses 4 QoL domains: physical, psychological, social, and environmental. The second instrument is the EuroQol-5 Dimensions (EQ-5D) [3], which covers 5 health state dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. In addition to these 5 dimensions, the EQ-5D includes a visual analog scale (VAS) for rating overall health status. Both measures have been translated and employed in clinical and community studies worldwide [4,5].

Despite their similar aim of measuring an individual's health-related QoL, the WHOQoL-BREF and EQ-5D are based on different conceptual frameworks [6]. The WHOQoL-BREF is a profile-based measure constructed to evaluate specific domains using multiple items [7]. This profile-based approach is valuable in assessing health or its domains from the patient's perspective, particularly in clinical trials where detailed information and sensitivity to clinical changes are required [6].

In contrast, the EQ-5D is a preference-based measure designed to capture health states and facilitate the calculation of quality-adjusted life years (QALYs) [8]. Self-reported information from the 5 domains is converted into an index score (or utility value) using country-specific public preferences for various health states—hence, it is classified as a preference-based measure [9]. Similar to profile-based measures, preference-based measures assess health from the patient's perspective; however, the utility values produced by the EQ-5D can also be used for economic analyses of health interventions [6,7].

Numerous studies have explored the health-related QoL of populations beyond the Global North, where these instruments were originally developed. Both the WHOQoL-BREF and the EQ-5D have been translated and validated in Malaysia, ensuring their cultural and linguistic appropriateness. For example, the WHOQoL-BREF has demonstrated good psychometric properties in studies assessing the QoL of rural residents, where income levels were found to be associated with QoL [10]. Similarly, the EQ-5D has been validated for the Malaysian population, with country-specific value sets developed to reflect local health preferences. It has also been used to assess the QoL of both young and elderly Malaysians with low-income backgrounds [11], while country-specific utility value sets were developed in India [12] and Indonesia [13], facilitating cross-cultural comparisons. Together, these instruments allow for a comprehensive assessment of health-related QoL in Malaysia by capturing both broad subjective aspects (WHOQoL-BREF) and specific health state descriptions with economic utility (EQ-5D) relevant to Malaysia's diverse ethnic landscape and healthcare system.

However, the association between these 2 measures remains unclear. One study in Thailand mapped the WHOQoL-BREF onto the EQ-5D and found that only the physical domain of the WHOQoL-BREF was associated with EQ-5D utility values, though that study was limited to patients with chronic diseases [5]. Therefore, this study aimed to describe and compare WHOQoL-BREF and EQ-5D results using QoL data from a community-dwelling Malaysian population, examining differences across various sociodemographic characteristics. Malaysia's ethnic classification system is unique, incorporating 3 interrelated terms. "Bumiputera," meaning "sons of the soil," is a political designation that includes ethnic Malays and indigenous peoples, granting them certain legal and economic privileges [14]. Malays, the largest ethnic group, are automatically considered Bumiputera and are predominantly Muslim with distinct cultural and linguistic heritage. "Orang Asli" refers specifically to the indigenous peoples of Peninsular Malaysia who, despite their Bumiputera status, often

HIGHLIGHTS

- Both the World Health Organization Quality of Life–BREF (WHOQoL-BREF) and the EuroQol-5 Dimensions (EQ-5D) consistently indicated a relatively good health-related QoL among Malaysians.
- Although the domains of the WHOQoL-BREF and the dimensions of the EQ-5D were associated, the correlations were weak, indicating that the 2 measures are not interchangeable.
- The decision to use one measure or both in a study should consider the study's objectives and participant characteristics.

encounter greater socioeconomic challenges than Malays. This complex classification system significantly influences Malaysia's social, economic, and political landscape. Although comparing health-related QoL measures is not a new concept, this study adds to our understanding of the cultural relevance and applicability of the WHOQoL-BREF and EQ-5D in the Malaysian context. Our findings provide valuable insights for stakeholders selecting appropriate QoL measures for population-based studies in Malaysia and similar multicultural Asian settings.

Materials and Methods

Study Setting and Participants

This observational population study was conducted in the Segamat District of Johor State, Malaysia (Figure S1) [15]. Segamat hosts a longitudinal health and demographic surveillance system known as the South East Asia Community Observatory (SEACO), launched in November 2011 [15]. The district covers 2,851 km2 and has a population comprised of 50.6% men and 49.4% women; 67.5% of residents are aged 15 to 64 years. The majority of residents are of Malay and Bumiputera heritage (53.9%), followed by Chinese (31.9%) and Indian (8.3%) ethnic groups [16]. This population structure closely resembles the national profile (51.4% male; 67.3% aged 15 to 64; 61.9% Malay and Bumiputera, 22.5% Chinese, and 6.7% Indian). Participants who consented during the 2017 SEACO census were invited to participate in the 2018 Health Survey [17], which provided the data that were analyzed in this study.

Data Collection

This cross-sectional study used data from the SEACO 2018 Health Survey [17], conducted every 5 years. Data were collected in 2018–2019 by trained enumerators who visited consenting households. Using handheld electronic devices, enumerators conducted interviews, encrypted the data, and uploaded it to a secure server. Further details on data collection are provided in previous reports [10,18]. The collected explanatory variables are presented in Table 1 [19,20].

Outcome Measures

The WHOQoL-BREF [1] was introduced in 1996 and has been translated into many languages worldwide, including Malay [21]. This instrument contains 26 items covering overall QoL and general health (2 items), physical health (7 items), psychological (6 items), social relationships (3 items), and the environment (8 items). Each item is scored on a scale from 1 (very poor) to 5 (very good), with higher total domain scores indicating better conditions in that domain. Domain scores may be compared with the full WHOQoL-100 by transforming the raw scores according to the user's manual [1]. The internal consistency (α) of each domain was 0.47 for physical health, 0.66 for psychological, 0.76 for social relationships, and 0.70 for environment.

The EQ-5D has evolved into a family of instruments designed for specific purposes. The original version, the EQ-5D-3L, comprises 5 dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) with 3 levels per domain (3). In 2009, the instrument was updated to the EQ-5D-5L, which features 5 levels of responses: no problem (1), slight (2), moderate (3), severe (4), and extreme/unable to do (5). This study used the latest version, which offers improved discriminatory power and responsiveness compared to the 3L version.

Table 1. Explanatory variables

Variable	Description
Age	Participants were asked for their age, which then was categorized into 9 age groups from 16–17, then 5-year intervals, to older than 84 years old.
Monthly household income	Monthly household income was categorized into 3 categories that were recognized nationally, including bottom-40% (B40, <MYR 4,360), middle-40% (M40, MYR 4,360–MYR 9,619), and top-20% (T20, >MYR 9,619, USD 1.0≈MYR 4.1 in 2016) based on the information from the Department of Statistics Malaysia in 2016 [19,20].
Sex	Participants were asked about their sex with 3 options, but only 2 categories were reported by them, including male and female (none chose "other").
Ethnicity	Ethnicity groups were categorized into Malay, Chinese, Indian, Orang Asli (indigenous people), other, and non-citizen.
Educational level	Participants' educational levels were categorized into no formal education, primary, secondary, tertiary, and other/do not know/refused to answer.
Occupation	Participants were asked about their work in the past 30 days, with responses categorized into 4 groups: working full-time, home-makers (including housewife/househusband), self-employed, and other (including too young to work, student, not working, casual jobs, working part-time, and pensioner).

MYR, Malaysian ringgit; USD, United States dollar.

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Participants selected the health status for each domain on the day they completed the questionnaire using these 5 levels. The combination of responses yields a 5-digit health profile; for example, a profile of 11111 indicates perfect health, while 55555 indicates extreme problems in all dimensions. This profile is then linked to an estimated utility value (EUV); for this study, we used the Malaysian value set from previous studies, with a possible range from −0.442 to 1 [22–24]. The reliability (α) of the EQ-5D-5L in this study was 0.79. In addition to the 5 dimensions, participants rated their overall health on a VAS ranging from 0 (the worst imaginable state) to 100 (the best imaginable state).

Despite their common goal of assessing QoL, the 2 measures differ in design and purpose. The WHOQoL-BREF provides a broader assessment, including domains such as environment and social relationships that are not directly addressed by the EQ-5D, and it employs multiple items per domain for a more nuanced evaluation. In contrast, the EQ-5D uses single items for each dimension, which may limit its sensitivity to subtle variations. The measures also differ temporally: the WHOQoL-BREF typically reflects experiences over the past 2 weeks, whereas the EQ-5D focuses on the current day. Furthermore, the WHOQoL-BREF was developed with cross-cultural applicability in mind, potentially capturing cultural nuances in perceptions of QoL more effectively than the EQ-5D. Finally, the EQ-5D is designed to generate utility values for economic evaluation, a feature not present in the WHOQoL-BREF.

Data Analysis

Descriptive analyses were performed to summarize central tendency measures. For inferential analyses, raw domain scores were used rather than transformed scores because their equal-interval properties allow for more direct comparisons with other international measures [6]. Transformed domain scores (Tables S1–S6) were used solely for descriptive comparisons between domains. The user's manual provided guidance for managing missing values; however, since a small percentage of participants (n = 273, 1.41%) did not complete the scale—particularly Item 21 ("How satisfied are you with your sex life?")—these participants were excluded from the analysis.

The transformed WHOQoL-BREF domain scores and EQ-5D scores were cross-tabulated with demographic variables (e.g., age group) to visually inspect differences among sub-groups. Normality was assessed using Kolmogorov-Smirnov tests and verified visually with histograms and Q-Q plots (Tables S7, S8; Figures S2, S3). The tests indicated that the overall QoL and general health items, all 4 WHOQoL-BREF domains, and all 5 EQ-5D items were not normally distributed (p < 0.05), with skewness coefficients ranging from −4.7 to 8.3. However, non-normality is common in large samples, where even small deviations from normality become statistically significant [25].

The t-test and one-way analysis of variance were conducted to examine differences in QoL among demographic sub-groups, including age, monthly household income, sex, and ethnicity. Effect sizes were calculated using Cohen's d and partial eta squared. Correlations between the WHOQoL-BREF and the EQ-5D were evaluated using the Pearson correlation coefficient. All analyses were conducted using IBM SPSS version 27.0 (IBM Corp.), with a 2-tailed p-value of 0.05 indicating statistical significance.

Ethics Approval

This study was approved by the Monash University Human Research Ethics Committee (MUHREC, Project ID 2018-13142) and followed the Declaration of Helsinki. Informed consent was obtained from all individual participants included in the study. Written informed consent was obtained for publication of this study and accompanying images.

Results

Participant Characteristics

A total of 19,402 people provided consent to participate in the study. After removing 273 participants (1.41%) who did not complete the WHOQoL-BREF questionnaire, data from 19,129 participants were included in the analysis. Demographic information is presented in Table 2, organized by age group. Participants ranged in age from 16 to 99 years, with an average age of 48.5 years (standard deviation [SD], 18.7); the gender distribution was relatively balanced, with 44.0% male and 56.0% female. The majority belonged to the B40 income group (79.7%) and were of Malay ethnicity (62.7%), reflecting semi-urban and rural population characteristics.

Quality of Life: WHOQoL-BREF

The WHOQoL-BREF results indicated average perceived general QoL and health scores of 3.82 (SD, 0.60) and 3.85 (SD, 0.60), respectively, suggesting relatively good overall QoL and satisfaction with health. Figure 1 visually display the 4 WHOQoL-BREF domains across sub-groups defined by age, ethnicity, household income, and age group, using a standardized 100-point scale (Tables S1–S6). The environment domain (Domain 4: mean, 71.7; SD, 11.3) was slightly lower than the physical health (Domain 1: mean, 75.7; SD, 11.7), psychological (Domain 2: mean, 75.8; SD, 10.7), and social relationships (Domain 3: mean, 75.4; SD, 11.4) domains. The data also indicate that men perceive their physical health slightly more favorably than women. In other panels, ethnic

Table 2. Demographic characteristics of participants (*n* = 19,129)

Characteristic	16–17 y (*n* = 952)	18–24 y (*n* = 1,886)	25–34 y (*n* = 2,481)	35–44 y (*n* = 2,448)	45–54 y (*n* = 2,976)	55–64 y (*n* = 4,120)	65–74 y (*n* = 2,952)	75–84 y (*n* = 1,142)	>84 y (*n* = 172)	Total (*n* = 19,129)
Age (y)	16.5 ± 0.5	20.5 ± 2.0	29.8 ± 2.8	39.5 ± 2.9	49.8 ± 2.9	59.7 ± 2.8	68.7 ± 2.7	78.7 ± 2.7	88.1 ± 3.0	48.5 ± 18.7
Household income /mo, MYR)	2,687 ± 2,658	3,575 ± 2,802	3,659 ± 2,833	3,415 ± 2,942	3,205 ± 2,943	2,717 ± 2,463	2,066 ± 1,923	1,696 ± 1,935	1,912 ± 1,961	2,919 ± 2,671
Household income category										
B40	789 (82.9)	1,366 (72.4)	1,726 (69.6)	1,819 (74.3)	2,294 (77.1)	3,405 (82.6)	2,644 (89.6)	1,048 (91.8)	153 (89.0)	15,244 (79.7)
M40	139 (14.6)	452 (24.0)	665 (26.8)	538 (22.0)	565 (19.0)	633 (15.4)	287 (9.7)	84 (7.4)	19 (11.0)	3,382 (17.7)
T20	24 (2.5)	68 (3.6)	90 (3.6)	91 (3.7)	117 (3.9)	82 (2.0)	21 (0.7)	10 (0.9)	0 (0.0)	503 (2.6)
Sex										
Male	440 (46.2)	910 (48.3)	1,085 (43.7)	1,002 (40.9)	1,206 (40.5)	1,719 (41.7)	1,473 (49.9)	525 (46.0)	66 (38.4)	8426 (44.0)
Female	512 (53.8)	976 (51.7)	1,396 (56.3)	1,446 (59.1)	1,770 (59.5)	2,401 (58.3)	1,479 (50.1)	617 (54.0)	106 (61.6)	10,703 (56.0)
Ethnicity										
Malay	634 (66.6)	1,361 (72.2)	1,783 (71.9)	1,589 (64.9)	1,833 (61.6)	2,471 (60.0)	1,697 (57.5)	558 (48.9)	73 (42.4)	11,999 (62.7)
Chinese	212 (22.3)	253 (13.4)	236 (9.5)	382 (15.6)	672 (22.6)	1,128 (27.4)	970 (32.9)	501 (43.9)	85 (49.4)	4,439 (23.2)
Indian	77 (8.1)	181 (9.6)	239 (9.6)	253 (10.3)	325 (10.9)	447 (10.8)	252 (8.5)	74 (6.5)	9 (5.2)	1,857 (9.7)
Orang Asli	24 (2.5)	59 (3.1)	79 (3.2)	72 (2.9)	60 (2.0)	33 (0.8)	18 (0.6)	6 (0.5)	2 (1.2)	353 (1.8)
Other	4 (0.4)	9 (0.5)	13 (0.5)	17 (0.7)	12 (0.4)	15 (0.4)	8 (0.3)	1 (0.1)	0 (0.0)	79 (0.4)
Non-citizen	1 (0.1)	23 (1.2)	131 (5.3)	135 (5.5)	74 (2.5)	26 (0.6)	7 (0.2)	2 (0.2)	3 (1.7)	402 (2.1)
Educational level										
No formal education	5 (0.5)	29 (1.5)	97 (3.9)	147 (6.0)	284 (9.5)	839 (20.4)	992 (33.6)	719 (63.0)	138 (80.2)	3,250 (17.0)
Primary (Pendidikan rendah)	22 (2.3)	107 (5.7)	263 (10.6)	442 (18.1)	624 (21.0)	1,528 (37.1)	1,310 (44.4)	306 (26.8)	22 (12.8)	4,624 (24.2)
Secondary (Pendidikan menengah rendah; menengah atas)	158 (16.6)	918 (48.7)	1,427 (57.5)	1,462 (59.7)	1,875 (63.0)	1,597 (38.8)	588 (19.9)	94 (8.2)	9 (5.2)	8,128 (42.5)
Tertiary (Pendidikan tinggi)	2 (0.2)	222 (11.8)	534 (21.5)	302 (12.3)	151 (5.1)	137 (3.3)	43 (1.5)	15 (1.3)	0 (0.0)	1,406 (7.4)
Other/do not know/ refused to answer	765 (80.4)	610 (32.3)	160 (6.4)	95 (3.90)	42 (1.4)	19 (0.5)	19 (0.6)	8 (0.7)	3 (1.7)	1,721 (9.0)
Work (in the past 30 days)										
Working full-time	35 (3.7)	708 (37.5)	1,289 (52.0)	1,136 (46.4)	1,080 (36.3)	717 (17.4)	250 (8.5)	19 (1.7)	1 (0.6)	5,235 (27.4)
Home-makers	3 (0.3)	99 (5.2)	651 (26.2)	735 (30.0)	1,001 (33.6)	1,623 (39.4)	930 (31.5)	308 (27.0)	31 (18.0)	5,381 (28.1)
Self-employed	7 (0.7)	99 (5.2)	280 (11.3)	356 (14.5)	512 (17.2)	582 (14.1)	377 (12.8)	67 (5.9)	3 (1.7)	2,283 (11.9)
Other	907 (95.3)	980 (52.0)	261 (10.5)	221 (9.0)	383 (12.9)	1,198 (29.1)	1,395 (47.3)	748 (65.5)	137 (79.7)	6,230 (32.6)

Data are presented as mean ± standard deviation or frequency (%).
MYR, Malaysian ringgit.

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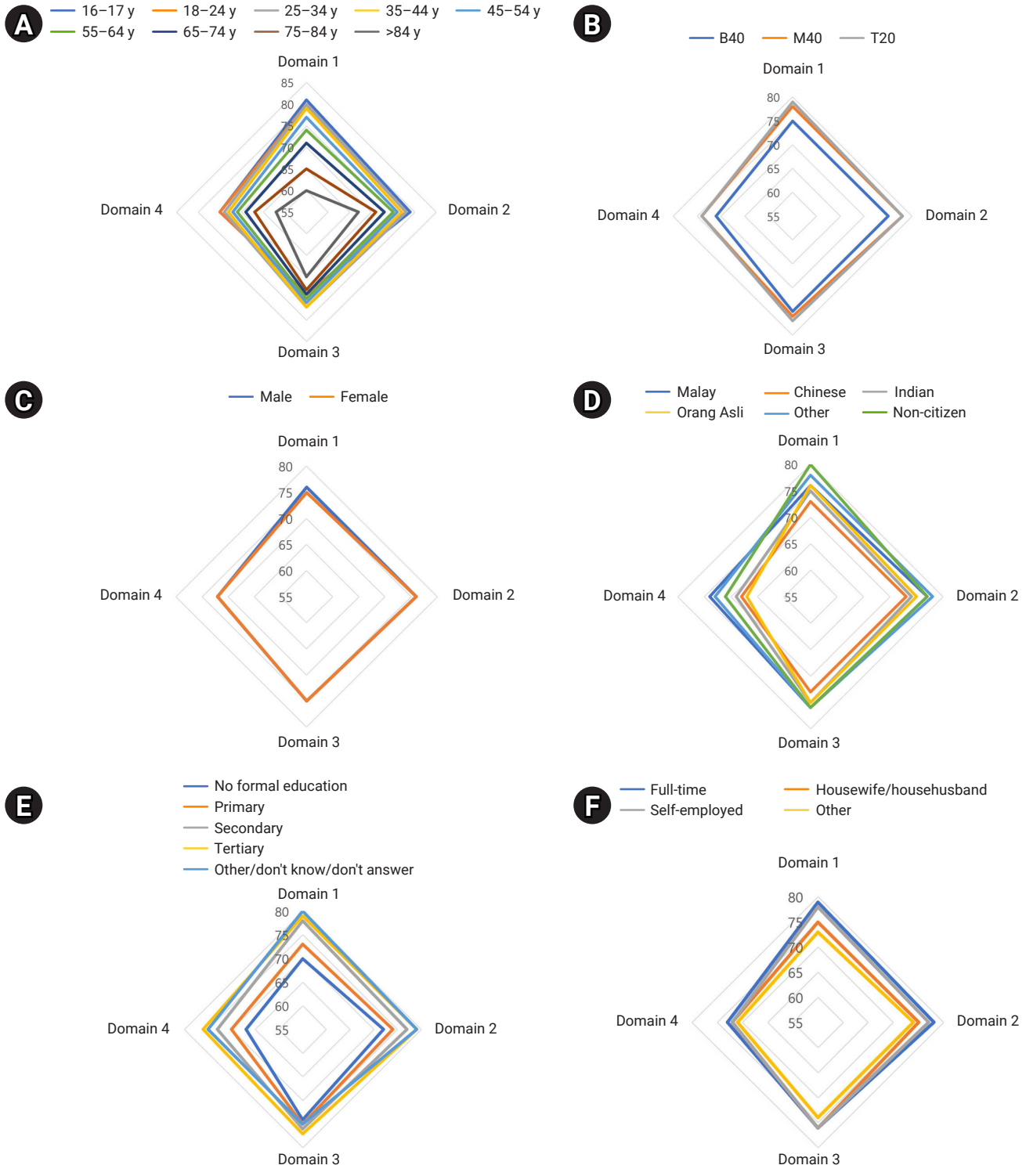

Figure 1. Four World Health Organization Quality of Life–BREF (WHOQoL-BREF) domains of quality of life in based on age group (A), household income category (B), sex (C), ethnicity (D), educational level (E), and occupation (F). Domain 1, physical health (mean, 75.7; standard deviation [SD], 11.7); Domain 2, psychological (mean, 75.8; SD, 10.7); Domain 3, social relationships (mean, 75.4; SD, 11.4); Domain 4, environment (mean, 71.7; SD, 11.3). Domain 4 had lower scores than the other 3 domains. Men perceive their physical health as slightly higher than women. Ethnic minority sub-groups (e.g., Chinese, Indian, and Orang Asli), B40 sub-group, and older sub-groups (i.e., ≥ 65 years) showed lower scores in all 4 domains than the more privileged sub-groups (i.e., Malay, T20, and younger sub-groups).

minority sub-groups (e.g., Chinese, Indian, and Orang Asli), the B40 sub-group, and older participants (i.e., ≥65 years) scored lower on all 4 domains compared with more privileged sub-groups (i.e., Malay, T20, and younger groups).

Quality of Life: EQ-5D

The EQ-5D findings revealed that participants generally experienced more intense problems in Dimension 4 (pain/discomfort; mean, 1.25; SD, 0.54; 20.9%) compared with other dimensions: mobility (mean, 1.18; SD, 0.53; 12.8%), self-care (mean, 1.05; SD, 0.32; 3.1%), usual activities (mean, 1.10; SD, 0.44; 6.9%), and anxiety/depression (mean, 1.08; SD, 0.33; 6.8%) (Table S9). The VAS indicated that participants generally reported good health (mean, 83.3; SD, 14.3), with an average EUV of 0.9402 (SD, 0.1495); additionally, 83.7% of participants reported no problems in all 5 dimensions. As with the WHOQoL-BREF, Figure 2 illustrates that ethnic minority groups (e.g., Chinese, Indian, and Orang Asli), the B40 sub-group, and older participants (i.e., ≥65 years) experienced more intense problems across all 5 dimensions compared with more privileged sub-groups (i.e., Malay, T20, and younger groups).

Correlation between WHOQoL-BREF and EQ-5D

Overall QoL and general health scores were positively correlated with all 4 WHOQoL-BREF domains ($p < 0.001$) and negatively correlated with all 5 EQ-5D dimensions ($p < 0.001$) (Table 2). Similarly, the EUV was positively correlated with all WHOQoL-BREF domains ($p < 0.001$) but showed a strong negative correlation with all EQ-5D dimensions (r ranging from −0.50 to −0.85; $p < 0.001$) (Table 3). While there were mild positive correlations among the 4 WHOQoL-BREF domains (r ranging from 0.43 to 0.66) and mild to moderate positive correlations among the 5 EQ-5D dimensions (r ranging from 0.23 to 0.69), the physical domain (Domain 1) of the WHOQoL-BREF demonstrated a mild negative correlation with the mobility dimension of the EQ-5D ($r = -0.42$, $p < 0.001$) and a mild positive correlation with self-rated health ($r = 0.42$, $p < 0.001$) and the EUV ($r = 0.45$, $p < 0.001$).

Explanatory Variables

Tables 4 and 5 present detailed results of participants' QoL as measured by both the WHOQoL-BREF and EQ-5D, stratified by demographic characteristics such as age, household income category, sex, and ethnicity. Differences in QoL among these sociodemographic sub-groups are described in the following paragraphs and Tables S10–S21.

Age

In general, QoL scores, along with the associated domains and dimensions, self-rated health, and EUVs, were lower in older age groups. Post-hoc tests revealed further differences within age sub-groups, with the level of health-related problems increasing with age. For instance, the percentage of participants with perfect health (11111) was 99.1% among 16- to 17-year-old, dropping to 57.8% among those aged 65 to 74. Moreover, effect size analyses indicated that physical health consistently exhibited the highest effect, as shown by the physical domain of the WHOQoL-BREF ($\eta^2 = 0.15$) and the mobility dimension of the EQ-5D ($\eta^2 = 0.12$).

Monthly household income

Analysis by household income category revealed that QoL and health conditions were consistently lower in the B40 group compared with the M40 and T20 groups across all domains and dimensions. However, the effect sizes were very small: physical ($\eta^2 = 0.01$), psychological ($\eta^2 = 0.01$), environment ($\eta^2 = 0.01$), and social relationships ($\eta^2 < 0.01$) for WHOQoL-BREF domains; and pain/discomfort ($\eta^2 = 0.01$), mobility ($\eta^2 < 0.01$), self-care ($\eta^2 < 0.01$), usual activities ($\eta^2 < 0.01$), and anxiety/depression ($\eta^2 < 0.01$) for EQ-5D dimensions.

Sex

Comparisons by sex indicated that women reported higher overall perceived QoL than men (95% confidence interval (CI), −0.06 to −0.02). However, women rated their general health and EUV lower than men (95% CI, 0.01–0.04 and 95% CI, 0.01–0.02; respectively). The effect size differences between sexes were relatively small: physical ($d = 0.09$) and psychological ($d = 0.07$) for WHOQoL-BREF domains; and mobility ($d = -0.07$), pain/discomfort ($d = -0.09$), and anxiety/depression ($d = -0.08$) for EQ-5D dimensions.

Ethnicity

Ethnic sub-groups reported varying scores for overall QoL, its domains and dimensions, self-rated health, and EUVs. Post-hoc tests indicated that the overall QoL of the Orang Asli group was lower than that of other ethnic sub-groups (p ranging from <0.001 to 0.02). The Chinese ethnic group reported lower satisfaction with general health compared with other ethnic groups (p ranging from <0.001 to 0.03), except when compared with the Orang Asli group ($p = 0.21$). However, analyses of each WHOQoL-BREF domain consistently showed that the Malay group had higher scores than the ethnic minority groups (i.e., Chinese, Indian, and Orang Asli). Similarly, analyses of each EQ-5D dimension revealed that Malays perceived a lower intensity of problems compared with ethnic minority groups. The Orang Asli group reported lower self-rated health than other sub-groups

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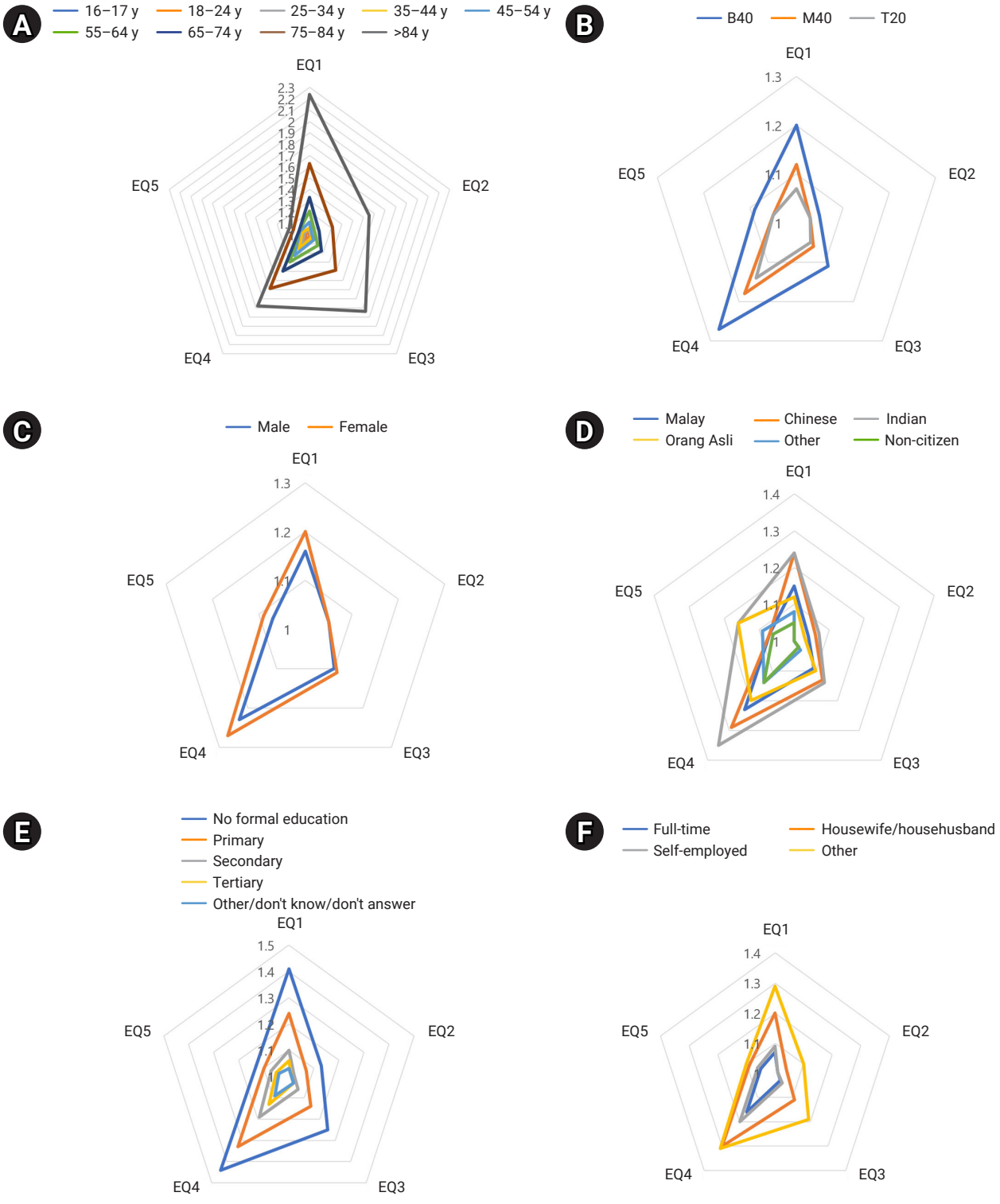

Figure 2. Five EuroQol-5 Dimensions (EQ-5D) dimensions of quality of life in based on age groups (A), household income category (B), sex (C), and ethnicity (D), educational level (E), and occupation (F). EQ1, mobility (mean, 1.18; standard deviation [SD], 0.53); EQ2, self-care (mean, 1.05; SD, 0.32); EQ3, usual activities (mean, 1.10; SD, 0.44); EQ4, pain/discomfort (mean, 1.25; SD, 0.54); EQ5, anxiety/depression (mean, 1.08; SD, 0.33). Ethnic minority groups (e.g., Chinese, Indian, and Orang Asli), B40 sub-group, and older sub-groups (i.e., 65 years and above) showed more intense conditions in all 5 dimensions than the more privileged sub-groups (i.e., Malay, T20, and younger sub-groups).

Table 3. Correlational analyses between WHOQoL-BREF domains (raw score) and EQ-5D dimensions

QoL	Overall QoL (Q1)	General health (Q2)	Domain 1	Domain 2	Domain 3	Domain 4	EQ1	EQ2	EQ3	EQ4	EQ5	VAS	EUV
Overall QoL (Q1)	1.00	0.36***	0.25***	0.35***	0.27***	0.33***	−0.11***	−0.08***	−0.10***	−0.11***	−0.11***	0.20***	0.14***
General health (Q2)		1.00	0.43***	0.39***	0.25***	0.31***	−0.22***	−0.16***	−0.21***	−0.23***	−0.15***	0.31***	0.26***
Domain 1			1.00	0.58***	0.43***	0.49***	−0.42***	−0.29***	−0.38***	−0.35***	−0.21***	0.42***	0.45***
Domain 2				1.00	0.54***	0.66***	−0.22***	−0.15***	−0.19***	−0.17***	−0.20***	0.26***	0.24***
Domain 3					1.00	0.59***	−0.07***	−0.06***	−0.08***	−0.06***	−0.07***	0.13***	0.09***
Domain 4						1.00	−0.16***	−0.11***	−0.13***	−0.13***	−0.12***	0.23***	0.18***
EQ1							1.00	0.57***	0.68***	0.52***	0.27***	−0.36***	−0.85***
EQ2								1.00	0.69***	0.36***	0.23***	−0.24***	−0.71***
EQ3									1.00	0.47***	0.28***	−0.32***	−0.80***
EQ4										1.00	0.29***	−0.38***	−0.77***
EQ5											1.00	−0.20***	−0.50***
VAS												1.00	0.41***
EUV													1.00

WHOQoL-BREF, World Health Organization Quality of Life–BREF; EQ-5D, EuroQol-5 Dimensions; QoL, quality of life; Domain 1, physical health; Domain 2, psychological; Domain 3, social relationships; Domain 4, environment; EQ1, mobility; EQ2, self-care; EQ3, usual activities; EQ4, pain/discomfort; EQ5, anxiety/depression; VAS, visual analogue scale/self-rated health; EUV, estimated utility value.
***$p < 0.001$.

($p < 0.001$), while the Indian group reported a lower EUV compared with other ethnic groups (p ranging from < 0.001 to 0.01).

Educational level

QoL findings varied based on educational sub-groups. *Post-hoc* tests consistently showed that participants with no formal education had lower QoL than those with some formal education (p ranging from < 0.001 to 0.02), regardless of whether QoL was measured using the WHOQoL-BREF or the EQ-5D.

Occupation

Differences in QoL were also observed across occupational sub-groups. *Post-hoc* tests of the WHOQoL-BREF indicated that participants engaged in full-time work generally reported better QoL than those in other occupational categories (p ranging from < 0.001 to 0.02), except in the social relationships domain, where scores were comparable to those of home-makers ($p = 0.99$). *Post-hoc* analyses for the EQ-5D showed that full-time workers generally had better QoL than other sub-groups (p ranging from < 0.001 to 0.01), although their scores were comparable to those of self-employed participants, particularly for mobility ($p = 0.23$), self-care ($p = 0.97$), usual activities ($p = 0.87$), and anxiety/depression ($p = 0.99$) domains.

Discussion

Using large community data representative of Malaysia's national demographics, this study aimed to describe and compare health-related QoL as measured by the WHOQoL-BREF and the EQ-5D across various sociodemographic characteristics. Both measures consistently indicated a relatively good quality of health and health status, which aligns with previous studies on the validation of the Malaysian EQ-5D and the development of its utility value sets [24,26]. Furthermore, correlational analyses revealed that all 4 WHOQoL-BREF domains and all 5 EQ-5D dimensions were significantly correlated; however, these correlations were relatively weak . The weak correlations may be attributed to the fundamental differences in purpose between the 2 measures. The physical health domain (Domain 1 of the WHOQoL-BREF) showed the strongest correlation with the EQ-5D dimensions, followed by the psychological (Domain 2), environmental (Domain 4), and social relationships (Domain 3) domains. On one hand, these findings support the results of a mapping study among chronic patients in Thailand, in which only physical health was associated with the EQ-5D [5]. On the other hand, our study of a large community sample indicates that the other 3 domains are also correlated with the EQ-5D.

Similar to previous studies among rural [10] and older Malaysians [11], this study found that QoL was lower in older

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Table 4. Demographic characteristics and quality of life measured with WHOQoL-BREF

Demographic characteristic	Overall QoL (Q1)	General health (Q2)	Domain 1	Domain 2	Domain 3	Domain 4
Age group (y)						
16–17 (*n* = 952)	3.99 ± 0.60	4.03 ± 0.60	29.56 ± 3.19	24.85 ± 2.83	11.88 ± 1.77	31.65 ± 3.96
18–24 (*n* = 1,886)	3.92 ± 0.59	3.99 ± 0.60	29.46 ± 2.95	24.8 ± 2.53	11.89 ± 1.62	31.38 ± 3.57
25–34 (*n* = 2,481)	3.89 ± 0.61	3.93 ± 0.59	29.29 ± 2.94	24.67 ± 2.50	12.21 ± 1.45	31.16 ± 3.63
35–44 (*n* = 2,448)	3.82 ± 0.60	3.88 ± 0.60	29.1 ± 2.85	24.52 ± 2.47	12.18 ± 1.38	30.73 ± 3.53
45–54 (*n* = 2,976)	3.77 ± 0.60	3.83 ± 0.60	28.63 ± 2.88	24.25 ± 2.41	12.16 ± 1.25	30.49 ± 3.43
55–64 (*n* = 4,120)	3.81 ± 0.59	3.81 ± 0.59	27.65 ± 2.92	23.95 ± 2.39	12.06 ± 1.19	30.21 ± 3.43
65–74 (*n* = 2,952)	3.76 ± 0.58	3.76 ± 0.59	26.8 ± 3.14	23.55 ± 2.45	11.92 ± 1.22	29.62 ± 3.52
75–84 (*n* = 1,142)	3.71 ± 0.59	3.63 ± 0.60	25.27 ± 3.37	22.95 ± 2.51	11.72 ± 1.36	28.8 ± 3.26
> 84 (*n* = 172)	3.65 ± 0.61	3.48 ± 0.62	23.84 ± 3.90	22.12 ± 2.76	11.39 ± 1.59	27.43 ± 3.99
Household income category						
B40 (*n* = 15,244)	3.80 ± 0.60	3.83 ± 0.61	28.02 ± 3.28	24.05 ± 2.55	12.01 ± 1.35	30.25 ± 3.61
M40 (*n* = 3,382)	3.91 ± 0.58	3.90 ± 0.57	28.69 ± 3.07	24.57 ± 2.44	12.13 ± 1.42	31.12 ± 3.48
T20 (*n* = 503)	4.00 ± 0.57	3.90 ± 0.66	29.02 ± 2.94	24.59 ± 2.51	12.24 ± 1.34	31.3 ± 3.42
Sex						
Male (*n* = 8,426)	3.80 ± 0.61	3.86 ± 0.60	28.32 ± 3.25	24.25 ± 2.51	12.03 ± 1.35	30.4 ± 3.55
Female (*n* = 10,703)	3.84 ± 0.59	3.83 ± 0.61	28.04 ± 3.24	24.08 ± 2.56	12.04 ± 1.38	30.45 ± 3.64
Ethnicity group						
Malay (*n* = 11,999)	3.81 ± 0.60	3.85 ± 0.60	28.39 ± 3.15	24.47 ± 2.31	12.13 ± 1.33	31.01 ± 3.40
Chinese (*n* = 4,439)	3.82 ± 0.62	3.80 ± 0.61	27.54 ± 3.44	23.45 ± 2.89	11.79 ± 1.51	29.33 ± 3.93
Indian (*n* = 1,857)	3.88 ± 0.58	3.86 ± 0.65	27.93 ± 3.37	23.72 ± 2.69	12.02 ± 1.22	29.66 ± 3.36
Orang Asli (*n* = 353)	3.65 ± 0.69	3.88 ± 0.62	28.34 ± 3.04	23.85 ± 2.48	11.97 ± 1.13	29.01 ± 3.25
Other (*n* = 79)	3.89 ± 0.55	4.01 ± 0.49	28.96 ± 2.71	24.77 ± 2.18	12.16 ± 1.35	30.97 ± 3.61
Non-citizen (*n* = 402)	3.79 ± 0.53	3.97 ± 0.46	29.31 ± 2.47	24.47 ± 2.33	12.08 ± 1.27	30.14 ± 3.30
Educational level						
No formal education (*n* = 3,250)	3.73 ± 0.59	3.74 ± 0.59	26.56 ± 3.41	23.32 ± 2.54	11.82 ± 1.31	29.00 ± 3.48
Primary (*n* = 4,624)	3.77 ± 0.60	3.8 ± 0.60	27.55 ± 3.17	23.78 ± 2.49	11.99 ± 1.24	29.87 ± 3.50
Secondary (*n* = 8,128)	3.82 ± 0.60	3.87 ± 0.60	28.7 ± 2.98	24.42 ± 2.44	12.12 ± 1.36	30.84 ± 3.46
Tertiary (*n* = 1,406)	3.99 ± 0.58	3.95 ± 0.59	29.26 ± 2.95	24.95 ± 2.39	12.29 ± 1.47	31.86 ± 3.43
Other/do not know/refused to answer (*n* = 1,721)	3.99 ± 0.58	3.99 ± 0.61	29.42 ± 3.11	24.8 ± 12.64	11.99 ± 1.64	31.51 ± 3.76
Work (in the past 30 days)						
Working full-time (*n* = 5,235)	3.86 ± 0.59	3.92 ± 0.58	29.07 ± 2.80	24.58 ± 2.40	12.15 ± 1.34	30.82 ± 3.44
Home-makers (*n* = 5,381)	3.82 ± 0.59	3.83 ± 0.60	27.87 ± 3.09	24.05 ± 2.45	12.15 ± 1.24	30.44 ± 3.58
Self-employed (*n* = 2,283)	3.76 ± 0.62	3.87 ± 0.57	28.73 ± 2.82	24.38 ± 2.30	12.09 ± 1.29	30.56 ± 3.36
Other (*n* = 6,230)	3.82 ± 0.61	3.79 ± 0.64	27.46 ± 3.65	23.80 ± 2.74	11.83 ± 1.48	30.05 ± 3.80
Total (*n* = 19,129)	3.82 ± 0.60	3.85 ± 0.60	28.17 ± 3.25	24.15 ± 2.54	12.04 ± 1.37	30.43 ± 3.60

Data are presented as mean ± standard deviation.
WHOQoL-BREF, World Health Organization Quality of Life–BREF; QoL, quality of life; Domain 1, physical health; Domain 2, psychological; Domain 3, social relationships; Domain 4, environment.

age groups, particularly in the physical health domain (e.g., physical and mobility aspects). This finding supports a recent systematic review of population-based QoL assessments, which recommended active aging to prevent QoL decline due to sedentary lifestyles [4]. Effect size analyses suggest that studies focusing on psychological health differences between age groups might consider using the WHOQoL-BREF over the EQ-5D, as the former appears more sensitive to psychological changes, as also found in a systematic review on QoL among older adults [27]. Conversely, if the study's focus is on the level of health-related problems and utility values, the EQ-5D may be preferable for comparing age groups. For instance, a study in South Korea using the 2021 Community Health Survey found that older adults experienced a decline in health-related QoL during the coronavirus disease 2019 (COVID-19) pandemic, as measured by the EQ-5D [28].

The less privileged B40 group consistently showed lower QoL compared with higher economic groups across

Table 5. Demographic characteristics and quality of life measured with EQ-5D

Demographic characteristic	EQ1	EQ2	EQ3	EQ4	EQ5	VAS	Full health (11111)	EUV
Age group (y)								
16–17 (*n* = 952)	1.01 ± 0.14	1.01 ± 0.14	1.02 ± 0.18	1.08 ± 0.35	1.04 ± 0.22	90.96 ± 12.1	867 (91.1)	0.989 ± 0.045
18–24 (*n* = 1,886)	1.02 ± 0.19	1.01 ± 0.13	1.01 ± 0.16	1.08 ± 0.31	1.03 ± 0.20	89.87 ± 11.79	1,709 (90.6)	0.989 ± 0.044
25–34 (*n* = 2,481)	1.05 ± 0.28	1.01 ± 0.14	1.03 ± 0.22	1.12 ± 0.41	1.05 ± 0.25	88.42 ± 11.81	2,112 (85.1)	0.982 ± 0.059
35–44 (*n* = 2,448)	1.06 ± 0.33	1.01 ± 0.17	1.03 ± 0.26	1.16 ± 0.43	1.07 ± 0.30	86.83 ± 11.95	1,992 (81.4)	0.976 ± 0.066
45–54 (*n* = 2,976)	1.11 ± 0.38	1.02 ± 0.18	1.06 ± 0.33	1.23 ± 0.50	1.09 ± 0.34	83.81 ± 12.83	2,189 (73.6)	0.965 ± 0.079
55–64 (*n* = 4,120)	1.21 ± 0.54	1.05 ± 0.32	1.12 ± 0.47	1.3 ± 0.58	1.1 ± 0.37	80.77 ± 14.15	2,725 (66.1)	0.946 ± 0.111
65–74 (*n* = 2,952)	1.33 ± 0.68	1.09 ± 0.41	1.18 ± 0.57	1.4 ± 0.64	1.1 ± 0.36	77.75 ± 14.3	1,705 (57.8)	0.926 ± 0.132
75–84 (*n* = 1,142)	1.63 ± 0.90	1.21 ± 0.65	1.39 ± 0.80	1.59 ± 0.76	1.15 ± 0.45	71.44 ± 15.63	476 (41.7)	0.871 ± 0.179
> 84 (*n* = 172)	2.24 ± 1.17	1.55 ± 1.04	1.84 ± 1.15	1.78 ± 0.85	1.19 ± 0.47	66.95 ± 16.55	42 (24.4)	0.772 ± 0.240
Household income category								
B40 (*n* = 15,244)	1.2 ± 0.55	1.05 ± 0.34	1.11 ± 0.46	1.27 ± 0.56	1.09 ± 0.34	82.65 ± 14.61	10,737 (70.4)	0.951 ± 0.111
M40 (*n* = 3,382)	1.12 ± 0.44	1.03 ± 0.24	1.06 ± 0.35	1.18 ± 0.45	1.05 ± 0.25	85.42 ± 12.69	2,659 (78.6)	0.969 ± 0.083
T20 (*n* = 503)	1.07 ± 0.35	1.03 ± 0.27	1.05 ± 0.32	1.14 ± 0.41	1.05 ± 0.26	87.46 ± 11.87	421 (83.7)	0.976 ± 0.083
Sex								
Male (*n* = 8,426)	1.16 ± 0.51	1.05 ± 0.32	1.1 ± 0.44	1.23 ± 0.52	1.07 ± 0.30	83.31 ± 14.28	6,338 (75.2)	0.960 ± 0.103
Female (*n* = 10,703)	1.2 ± 0.54	1.05 ± 0.32	1.11 ± 0.45	1.27 ± 0.56	1.09 ± 0.35	83.23 ± 14.27	7,479 (69.9)	0.951 ± 0.108
Ethnicity group								
Malay (*n* = 11,999)	1.15 ± 0.51	1.04 ± 0.3	1.09 ± 0.43	1.23 ± 0.52	1.07 ± 0.31	84.17 ± 13.89	8,950 (74.6)	0.960 ± 0.100
Chinese (*n* = 4,439)	1.24 ± 0.58	1.06 ± 0.36	1.13 ± 0.48	1.29 ± 0.56	1.07 ± 0.29	81.03 ± 14.44	3,022 (68.1)	0.946 ± 0.114
Indian (*n* = 1,857)	1.24 ± 0.61	1.07 ± 0.40	1.14 ± 0.50	1.35 ± 0.64	1.16 ± 0.47	82.81 ± 15.28	1,192 (64.2)	0.936 ± 0.131
Orang Asli (*n* = 353)	1.12 ± 0.43	1.03 ± 0.26	1.1 ± 0.38	1.20 ± 0.49	1.16 ± 0.44	78.04 ± 17.58	263 (74.5)	0.962 ± 0.087
Other (*n* = 79)	1.08 ± 0.27	1 ± 0	1.03 ± 0.16	1.14 ± 0.35	1.09 ± 0.29	84.91 ± 12.36	60 (75.9)	0.975 ± 0.050
Non-citizen (*n* = 402)	1.05 ± 0.26	1 ± 0.07	1.02 ± 0.20	1.14 ± 0.42	1.06 ± 0.27	87.30 ± 11.56	330 (82.1)	0.979 ± 0.058
Educational level								
No formal education (*n* = 3,250)	1.41 ± 0.76	1.13 ± 0.50	1.25 ± 0.64	1.44 ± 0.69	1.13 ± 0.41	76.56 ± 15.83	1,778 (54.7)	0.880 ± 0.210
Primary (*n* = 4,624)	1.24 ± 0.60	1.07 ± 0.37	1.14 ± 0.52	1.33 ± 0.60	1.10 ± 0.37	80.72 ± 14.61	2,987 (64.6)	0.920 ± 0.170
Secondary (*n* = 8,128)	1.10 ± 0.40	1.02 ± 0.22	1.06 ± 0.34	1.19 ± 0.47	1.07 ± 0.29	85.15 ± 12.93	6,330 (77.9)	0.960 ± 0.110
Tertiary (*n* = 1,406)	1.06 ± 0.31	1.01 ± 0.13	1.03 ± 0.20	1.13 ± 0.38	1.05 ± 0.24	88.01 ± 11.43	1,186 (84.4)	0.980 ± 0.070
Other/do not know/refused to answer (*n* = 1,721)	1.03 ± 0.24	1.01 ± 0.18	1.03 ± 0.23	1.09 ± 0.36	1.04 ± 0.21	90.02 ± 11.77	1,536 (89.3)	0.980 ± 0.080
Work (in the past 30 days)								
Working full-time (*n* = 5,235)	1.07 ± 0.29	1.01 ± 0.14	1.03 ± 0.24	1.16 ± 0.43	1.05 ± 0.26	86.52 ± 12.55	4,260 (81.4)	0.970 ± 0.080
Home-makers (*n* = 5,381)	1.20 ± 0.52	1.04 ± 0.26	1.11 ± 0.42	1.30 ± 0.57	1.09 ± 0.35	82.28 ± 14.12	3,609 (67.1)	0.930 ± 0.140
Self-employed (*n* = 2,283)	1.09 ± 0.35	1.01 ± 0.16	1.04 ± 0.24	1.20 ± 0.47	1.06 ± 0.28	83.61 ± 12.92	1,760 (77.1)	0.960 ± 0.090
Other (*n* = 6,230)	1.29 ± 0.70	1.10 ± 0.48	1.19 ± 0.61	1.31 ± 0.62	1.10 ± 0.37	81.25 ± 15.69	4,188 (67.2)	0.910 ± 0.200
Total (*n* = 19,129)	1.18 ± 0.53	1.05 ± 0.32	1.10 ± 4.7	1.25 ± 0.54	1.08 ± 0.33	83.27 ± 14.28	13,817 (72.2)	0.955 ± 0.106

Data are presented as mean ± standard deviation or frequency (%).
EQ-5D, EuroQol-5 Dimensions; EQ1, mobility; EQ2, self-care; EQ3, usual activities; EQ4, pain/discomfort; EQ5, anxiety/depression; VAS, visual analog scale/self-rated health; EUV, estimated utility value.

both measures, supporting previous studies among lower-income households and rural communities in Malaysia [10,11,29]. Although both the WHOQoL-BREF and the EQ-5D proved useful, effect size analyses suggest that studies focusing on pain or discomfort outcomes might benefit more from using the EQ-5D, as observed in a previous cross-sectional study on determinants of health-related QoL in the Philippines [30]. Additionally, a study among Korean adults with cardiovascular disease found that lower income, unemployment, and lower education levels were significantly associated with reduced health-related QoL [31]. These factors, likely prevalent among the B40 group in our study, may help explain their lower QoL scores. This parallel finding underscores the importance of considering both sociodemographic and health-related factors when assessing QoL across different populations and health

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conditions.

Sex-based analyses revealed mixed results: women reported higher overall QoL (as per question 1 of the WHOQoL-BREF) but lower general health (question 2 of the WHOQoL-BREF) and lower utility values on the EQ-5D compared with men. A previous study among low socioeconomic Malaysians also found that women had nearly twice the risk of poor health status compared with men [29]. Thus, overall QoL may not reliably indicate an individual's general health, as correlational analyses demonstrated a stronger association between general health and the physical and psychological domains than with overall QoL. Both measures showed similar patterns, with differences in physical and psychological health between sexes. However, if a study focuses on personal pain and discomfort differences between sexes, the EQ-5D might be preferred over the WHOQoL-BREF.

Our study suggests that the WHOQoL-BREF may offer advantages in assessing health-related QoL among ethnic minorities and indigenous populations, particularly when evaluating social relationships and environmental factors. The environment domain exhibited the most significant variations across ethnic groups. Both the WHOQoL-BREF and the EQ-5D indicated lower QoL scores for ethnic minority groups compared with the majority, aligning with previous research showing that non-Malays are at higher risk for poorer health status than Malays [10,11,29]. It would be interesting, however, to compare the QoL of ethnic minorities in Malaysia with that of the same ethnic groups in other countries. For example, the VAS score for the Indian ethnic group in Malaysia (82.81) was higher than that reported for the general population in India (75.18) [12].

Our findings also showed that the Orang Asli consistently reported lower QoL scores compared with other ethnic groups, including Malays. This suggests that despite their shared Bumiputera status [14], substantial disparities in lived experiences and access to resources affect their QoL. These distinctions are crucial for understanding the nuanced ethnic landscape in Malaysia and interpreting the QoL differences observed in our study. Future research could further explore how political and social classifications correlate with health outcomes and access to healthcare services. Notably, our study found that Orang Asli, or indigenous people in Peninsular Malaysia, reported the lowest health-related QoL, particularly in environment-related health. One possible explanation is that the Orang Asli community's intimate connection with the land and communal lifestyle has been severely impacted by modernization [32,33]. Similar effects of environmental change on QoL have been observed among indigenous people in Chile and native senior citizens in Hong Kong [34,35].

Participants with no formal education consistently reported lower QoL on both measures, a finding also noted in a study among low socioeconomic Malaysians where individuals with lower education had a 3-fold higher risk of inadequate health status compared with those with higher education [29]. However, for studies focusing on psychological health, researchers might consider using the WHOQoL-BREF over the EQ-5D because it may be more sensitive to capturing psychological status differences among educational groups, as shown in mapping studies among chronic psychiatric patients and individuals with diabetes [36,37]

When comparing occupational groups, QoL findings were relatively similar between the 2 measures. However, effect size analyses suggest that the WHOQoL-BREF may be more sensitive than the EQ-5D when the primary participants are home-makers whose QoL is compared with that of full-time workers, who might score higher on items related to work capacity [6]. Alternatively, if the primary participants are self-employed, the EQ-5D might be the preferred measure.

Practical Implications

Given the differing foundational perspectives of the WHOQoL-BREF and the EQ-5D, these measures are not intended to be used interchangeably, as also demonstrated in a study among chronic disease patients in Thailand [5]. Researchers should base their choice on the primary aims and participant characteristics of their study. Specifically, the WHOQoL-BREF may be more appropriate for comprehensive clinical assessments, whereas the EQ-5D may be preferable for economic evaluations. For instance, if the primary aim is to explore pain or discomfort in individuals with chronic diseases, the EQ-5D would be more suitable. Conversely, for studies examining QoL through psychological, social, and environmental lenses, the WHOQoL-BREF is likely a better fit. Moreover, our study suggests that the WHOQoL-BREF may be particularly well-suited for investigating QoL among ethnic minority and indigenous groups due to its broader scope in assessing social and environmental factors.

An alternative perspective is to use a complementary approach, combining both measures to achieve a richer understanding of an individual's or population's health status and QoL. The WHOQoL-BREF offers a comprehensive, in-depth assessment across 4 domains with multiple items, capturing subjective perceptions and being sensitive to psychological changes and cultural nuances. It excels in clinical trials and the evaluation of healthcare treatments. In contrast, the EQ-5D focuses on 5 specific health dimensions and produces concise, preference-based utility values, making it particularly useful for economic evaluations and health technology assessments that calculate QALYs.

Moreover, the EQ-5D is especially sensitive to issues of mobility and pain/discomfort, notably when comparing income groups, while the WHOQoL-BREF may better capture social relationships and environmental factors among ethnic minority and indigenous populations.

Beyond informing the selection of interventions, these findings can assist stakeholders in improving healthcare delivery and policy in Malaysia. The consistent differences in QoL across demographic groups suggest a need for targeted healthcare interventions. For example, lower QoL scores among older adults, particularly in physical domains, indicate the need for enhanced geriatric care and active aging programs. The high prevalence of pain/discomfort reported in the EQ-5D suggests that primary care services should emphasize pain management and chronic disease care. Furthermore, differences in psychological domains and anxiety/depression dimensions across groups underscore the importance of accessible mental health services for vulnerable populations. Lower QoL scores among lower-income groups (B40) and ethnic minorities highlight health disparities that policymakers should consider when allocating healthcare resources and designing public health initiatives to improve health equity. Similarly, the observed differences in QoL across educational levels point to a need for improved health literacy programs, especially among those with less formal education. Finally, differences in QoL between ethnic groups emphasize the importance of culturally competent healthcare for minority and indigenous populations.

Strengths and Limitations

This study is one of the first in Southeast Asia to evaluate the appropriateness of the 2 QoL measures [WHOQoL-BREF and EQ-5D) for population-based research. The use of valid and reliable instruments strengthens the study's validity. Moreover, data were collected from 19,129 participants with diverse sociodemographic characteristics that are common among residents in the Southeast Asia region. However, because of the convenience sampling technique, the results may be limited to a relatively healthier segment of the population, particularly those of lower socioeconomic status. Additionally, as this was not a longitudinal study, we were unable to fully assess the comparative sensitivity and suitability of the WHOQoL-BREF and EQ-5D over time. Future research would benefit from a longitudinal design that includes test–retest reliability for both instruments, thereby providing more robust evidence regarding their sensitivity to change and long-term reliability. It is also important to note that the choice of instrument may affect study outcomes; future studies might consider comparing results across different EQ-5D versions (e.g., the EQ-5D-3L).

Another limitation is that the data were collected in 2018–2019, which may not fully reflect the current health-related QoL landscape in Malaysia. The time gap between data collection and publication could affect the relevance of the findings, as socioeconomic conditions, health policies, and population demographics may have evolved. Furthermore, the COVID-19 pandemic, which began after the data collection period, has likely impacted various aspects of QoL, potentially limiting the applicability of pre-pandemic data to the current context. However, given that QoL measures tend to change gradually over time [28], some concerns regarding the use of older data may be mitigated.

Conclusion

This study described and compared health-related QoL as measured by the WHOQoL-BREF and the EQ-5D among the Malaysian population, based on their sociodemographic characteristics. Overall, the 2 measures produced consistent results for a relatively healthy community-based population; however, the association between them was relatively weak, indicating that they are not interchangeable. Researchers should select between these measures based on their specific research questions and intended data use, as each instrument has fundamental differences in design and purpose. While the WHOQoL-BREF provides a more comprehensive assessment of overall QoL—including psychosocial and environmental factors—the EQ-5D may be more appropriate for economic evaluations and for capturing specific health state descriptions.

Supplementary Material

Figure S1. Map of Segamat district (top left area in Johor State). **Figure S2.** (A) Histogram of general QoL. (B) Q-Q plot of general QoL. (C) Histogram of health satisfaction. (D) Q-Q plot of health satisfaction. (E) Histogram of WHOQoL-BREF Domain 1. (F) Q-Q plot of WHOQoL-BREF Domain 1. (G) Histogram of WHOQoL-BREF Domain 2. (H) Q-Q plot of WHOQoL-BREF Domain 2. (I) Histogram of WHOQoL-BREF Domain 3. (J) Q-Q plot of WHOQoL-BREF Domain 3. (K) Histogram of WHOQoL-BREF Domain 4. (L) Q-Q plot WHOQoL-BREF Domain 4. **Figure S3.** (A) Histogram of EQ-5D Dimension 1. (B) Q-Q plot of EQ-5D Dimension 1. (C) Histogram of EQ-5D Dimension 2. (D) Q-Q plot of EQ-5D Dimension 2. (E) Histogram of EQ-5D Dimension 3. (F) Q-Q plot of EQ-5D Dimension 3. (G) Histogram of EQ-5D Dimension 4. (H) Q-Q plot of EQ-5D Dimension 4. (I) Histogram of EQ-5D Dimension 5. (J) Q-Q plot of EQ-5D Dimension 5. **Table S1.** WHOQoL-BREF converted score

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100 points (age). **Table S2.** WHOQoL-BREF converted score 100 points (income). **Table S3.** WHOQoL-BREF converted score 100 points (sex). **Table S4.** WHOQoL-BREF converted score 100 points (ethnicity). **Table S5.** WHOQoL-BREF converted score 100 points (education). **Table S6.** WHOQoL-BREF converted score 100 points (occupation). **Table S7.** Normality tests and histograms: WHOQoL-BREF. **Table S8.** Normality tests and histograms: WHOQoL-BREF. **Table S9.** Demographic characteristics and quality of life measured with EQ-5D-5L. **Table S10.** *Post-hoc* WHOQoL-BREF (age). **Table S11.** *Post-hoc* EQ-5D (age). **Table S12.** *Post-hoc* WHOQoL-BREF (income). **Table S13.** *Post-hoc* EQ-5D (income). **Table S14.** *Post-hoc* WHOQoL-BREF (sex). **Table S15.** *Post-hoc* EQ-5D (sex). **Table S16.** *Post-hoc* WHOQoL-BREF (ethnicity). **Table S17.** *Post-hoc* EQ-5D (ethnicity). **Table S18.** *Post-hoc* WHOQoL-BREF (education). **Table S19.** *Post-hoc* EQ-5D (education). **Table S20.** *Post-hoc* WHOQoL-BREF (occupation). **Table S21.** *Post-hoc* EQ-5D (occupation). Supplementary data are available at https://doi.org/10.24171/j.phrp.2024.0076.

Notes

Ethics Approval

This study was approved by the Monash University Human Research Ethics Committee (MUHREC, Project ID 2018-13142) and followed the Declaration of Helsinki. Informed consent was obtained from all individual participants included in the study. Written informed consent was obtained for publication of this study and accompanying images.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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Availability of Data

The datasets are not publicly available but are available from the corresponding author upon reasonable request to the South East Asia Community Observatory (SEACO): https://www.monash.edu.my/seaco/research-and-training/how-to-collaborate-with-seaco.

Authors' Contributions

Conceptualization: RN, TTS, DR; Data curation: DR, TTS; Formal analysis: AL, HJC, RN; Funding acquisition: DR, TTS; Methodology: AL, HJC, RN, TTS; Writing–original draft: AL; Writing–review & editing: AL, HJC, VV, RN, DR, TTS. All authors read and approved the final manuscript.

References

1. World Health Organization (WHO) (CH). World Health Organization Quality of Life Instruments (WHOQOL-BREF) 1996 [Internet]. WHO; 1996 [cited 2022 Oct 02]. Available from: https://www.who.int/tools/whoqol/whoqol-bref.
2. Purba FD, Hunfeld JA, Iskandarsyah A, et al. Quality of life of the Indonesian general population: test-retest reliability and population norms of the EQ-5D-5L and WHOQOL-BREF. PLoS One 2018;13:e0197098.
3. EuroQol Group. EuroQol: a new facility for the measurement of health-related quality of life. Health Policy 1990;16:199–208.
4. Pequeno NP, Cabral NL, Marchioni DM, et al. Quality of life assessment instruments for adults: a systematic review of population-based studies. Health Qual Life Outcomes 2020;18:208.
5. Sakthong P. Mapping World Health Organization quality of life-BREF onto 5-level EQ-5D in Thai patients with chronic diseases. Value Health 2021;24:1089–94.
6. Wee HL, Yeo KK, Chong KJ, et al. Mean rank, equipercentile, and regression mapping of World Health Organization Quality of Life Brief (WHOQOL-BREF) to EuroQoL 5 Dimensions 5 Levels (EQ-5D-5L) utilities. Med Decis Making 2018;38:319–33.
7. Alberta PROMS and EQ-5D Research and Support Unit (APERSU) (CA). What are PROMs? Measuring health outcomes [Internet]. APERSU; 2022 [cited 2022 Jun 23]. Available from: https://sites.google.com/ualberta.ca/apersu/about-proms/what-are-proms.
8. Mehdipour A, Beauchamp MK, Wald J, et al. Measurement properties of preference-based measures for economic evaluation in COPD: a systematic review. Qual Life Res 2020;29:2875–85.
9. York Health Economics Consortium (YHEC) (GB). Preference-based measures [Internet]. YHEC; 2016 [cited 2022 Jun 22]. Available from: https://yhec.co.uk/glossary/preference-based-measures/.
10. Thangiah G, Said MA, Majid HA, et al. Income inequality in quality of life among rural communities in Malaysia: a case for immediate policy consideration. Int J Environ Res Public Health 2020;17:8731.
11. Rizal H, Said MA, Abdul Majid H, et al. Health-related quality of life of younger and older lower-income households in Malaysia. PLoS One 2022;17:e0263751.
12. Jyani G, Sharma A, Prinja S, et al. Development of an EQ-5D Value Set for India Using an Extended Design (DEVINE) study: the Indian 5-Level Version EQ-5D value set. Value Health 2022;25:1218–26.
13. Purba FD, Hunfeld JAM, Iskandarsyah A, et al. The Indonesian EQ-5D-5L value set. Pharmacoeconomics 2017;35:1153–65.
14. Ting R, Chung KR, Lim YL, et al. Ecological difference on the illness beliefs and determinants for healthcare utilization: a comparison study among indigenous people in Malaysia. Soc Sci Humanit Open 2024;Dec 9 [Epub]. https://doi.org/10.2139/ssrn.5034703.
15. Allotey P, Reidpath DD, Devarajan N, et al. Cohorts and community: a case study of community engagement in the establishment of a health and demographic surveillance site in Malaysia. Glob Health

Action 2014;7:23176.
16. City Population (DE). Segamat population statistics [Internet]. City Population; 2022 [2022 May 18]. Available from: https://www.citypopulation.de/en/malaysia/admin/johor/0108__segamat/.
17. South East Asia Community Observatory (SEACO) (MY). Risk factor surveillance update in South East Asia Community Observatory-Health Round 2018 [Internet]. SEACO; 2019 [cited 2019 Sep 3]. Available from: https://www.monash.edu.my/__data/assets/pdf_file/0005/2232275/Codebook-Health-Round-2018.pdf.
18. Tan MM, Reidpath DD, Ting RS, et al. Religiousness and quality of life among older adults of different ethnic groups in Malaysia: a five-year follow-up study. J Relig Health 2022;61:1548–63.
19. CompareHero (MY). Income classification in Malaysia: what is B40, M40 and T20? [Internet]. CompareHero; 2022 [cited 2022 Jul 30]. Available from: https://www.comparehero.my/budgets-tax/articles/t20-m40-b40-malaysia.
20. Department of Statistics Malaysia (MY). Report of household income and basic amenities survey 2016. Department of Statistics Malaysia; 2017.
21. Cheung YB, Yeo KK, Chong KJ, et al. Measurement equivalence of the English, Chinese and Malay versions of the World Health Organization quality of life (WHOQOL-BREF) questionnaires. Health Qual Life Outcomes 2019;17:67.
22. Shafie AA, Vasan Thakumar A, Lim CJ, et al. EQ-5D-5L valuation for the Malaysian population. Pharmacoeconomics 2019;37:715–25.
23. Shafie AA, Vasan Thakumar A, Lim CJ, et al. Psychometric performance assessment of Malay and Malaysian English version of EQ-5D-5L in the Malaysian population. Qual Life Res 2019;28:153–62.
24. Yusof FA, Goh A, Azmi S. Estimating an EQ-5D value set for Malaysia using time trade-off and visual analogue scale methods. Value Health 2012;15(1 Suppl):S85–90.
25. University of Bristol, Centre for Multilevel Modelling; The British Academy (GB). SPSS-exploring normality (practical): checking for normality (practical) [Internet]. University of Bristol; 2018. [cited 2022 Mar 3]. Available from: https://www.bristol.ac.uk/cmm/media/research/ba-teaching-ebooks/pdf/Normality%20-%20Practical.pdf.
26. Varatharajan S, Chen WS. Reliability and validity of EQ-5D in Malaysian population. Appl Res Qual Life 2012;7:209–21.
27. Cunningham C, O' Sullivan R, Caserotti P, et al. Consequences of physical inactivity in older adults: a systematic review of reviews and meta-analyses. Scand J Med Sci Sports 2020;30:816–27.
28. Kim DJ. Factors affecting depression and health-related quality of life in the elderly during the COVID-19 pandemic. Osong Public Health Res Perspect 2023;14:520–9.
29. Wan Puteh SE, Siwar C, Zaidi MA, et al. Health related quality of life (HRQOL) among low socioeconomic population in Malaysia. BMC Public Health 2019;19(Suppl 4):551.
30. Cheng KJ, Rivera AS, Miguel RT, et al. A cross-sectional study on the determinants of health-related quality of life in the Philippines using the EQ-5D-5L. Qual Life Res 2021;30:2137–47.
31. Lim JH. Predictors of health-related quality of life in Koreans with cardiovascular disease. Osong Public Health Res Perspect 2022;13:62–70.
32. Wong YS, Allotey P, Reidpath DD. Why we run when the doctor comes: Orang Asli responses to health systems in transition in Malaysia. Crit Public Health 2019;29:192–204.
33. Lasimbang A, Sein KO. SDGs and the well-being of the Orang Asal and Orang Asli. In: Mahadi A, Zhafri N, editors. Making SDGs matter: leaving no one behind [Internet]. Institute of Strategic and International Studies; 2021 [cited 2022 Apr 12]. Available from: https://www.isis.org.my/wp-content/uploads/2021/02/SDG-Book.pdf#page = 22.
34. Chang KK, Wong FK, Chan KL, et al. The impact of the environment on the quality of life and the mediating effects of sleep and stress. Int J Environ Res Public Health 2020;17:8529.
35. Gallardo-Peralta LP, Sanchez-Moreno E, Rodriguez-Rodriguez V. Quality of life in indigenous and non-indigenous older persons in the north of Chile. Interciencia 2018;43:313–6.
36. van de Willige G, Wiersma D, Nienhuis FJ, et al. Changes in quality of life in chronic psychiatric patients: a comparison between EuroQol (EQ-5D) and WHOQoL. Qual Life Res 2005;14:441–51.
37. Davies TT, Graue M, Igland J, et al. Diabetes prevalence among older people receiving care at home: associations with symptoms, health status and psychological well-being. Diabet Med 2019;36:96–104.

https://doi.org/10.24171/j.phrp.2024.0076