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Quality of life and overall well-being between healthy individuals and patients with varied clinical diagnoses

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Abstract

Background Chronic diseases are known to detrimentally impact an individual's quality of life (QOL) and well-being. Therefore, this study aims to evaluate the QOL and overall well-being among both healthy individuals and those with diverse primary diagnoses.

Methods This is a cross-sectional study and data collection took place from May 2022 to May 2023. Information regarding healthy participants was gathered from healthcare workers without any comorbidities. Data for non-healthy participants were collected from individuals diagnosed with various conditions across four specialist clinics: nephrology, oncology, psychiatry, and cardiology. All participants completed the Significant Quality of Life Measures (SigQOLM), a comprehensive assessment tool consisting of 69 items that evaluate 18 domains of QOL and well-being.

Results The study included a total of 452 participants, with 284 (62.8%) classified as healthy. Among the non-healthy participants, 41 (9.1%) had end-stage renal diseases (ESRD), 48 (10.6%) were diagnosed with cancer, 40 (8.8%) had depressive disorder, and the remaining had heart disease (8.6%). Statistical analysis revealed significant differences ($p < 0.001$) between healthy and non-healthy participants in both overall SigQOLM scores and across all 18 domains of SigQOLM.

Conclusion Generally, healthy participants also experienced excellent QOL and well-being. However, disparities in both QOL and overall well-being were evident among patients with various diagnoses. These findings provide valuable insights for medical practitioners and policy makers by enabling them to tailor interventions to enhance the QOL and well-being of their patients.

Keywords Healthy, Non-healthy, SigQOLM, Quality of life, Well-being

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Background

The necessity of standardized and validated outcome measures for monitoring quality of life (QOL) and well-being has been underscored in numerous scholarly works [1–3]. Traditionally, the assessment of QOL and well-being within a populace partly relies on statistical metrics crafted by economists, epidemiologists, and methodologists to gauge the economic performance of a nation or region, such as the Consumer Price Index (CPI), foreign direct investment (FDI), Gross domestic Product (GDP), and inflation rate [4, 5]. However, there exists a consensus among scholars that such metrics are inadequate in comprehensively capturing the multifaceted nature of well-being [2, 6, 7]. While these indicators may suffice for evaluating the performance of states or nations, they lack the requisite depth and breadth of coverage to thoroughly assess QOL and overall well-being of an individual.

Various types of QOL and well-being scales exist. However, the majority of these scales were developed more than 20 years ago [3, 8, 9] One recent scale is the Significant Quality of Life Measure (SigQOLM), developed in 2023, comprising 69 items across four elements and 18 domains. These elements include "health," "relationships," "functional activities," and "survival." In other words, a person's QOL and well-being is said to be excellent when the person maintains his/her survival while being in optimal health, having a meaningful relationship and is able to engage in daily functional activities [2].

It is widely acknowledged that chronic diseases will significantly impact the health-related quality of life (HRQOL) of individuals [10–12]. However, there remains a scarcity of research directly comparing the quality of life and well-being between healthy individuals and those afflicted by various chronic conditions. This presents an opportunity to explore these disparities by using recently developed, reliable, and validated scales for assessing QOL and overall well-being. Consequently, this study utilises the SigQOLM to assess the QOL and well-being among both healthy individuals and those with diverse primary diagnoses, such as end-stage renal disease (ESRD), cancer, depressive disorders, and heart disease. The objective is to determine the sensitivity of the SigQOLM domains in discerning differences in quality-of-life measures between healthy and non-healthy participants.

Methods

This cross-sectional study aimed to evaluate the QOL and well-being using the SigQOLM scale among both healthy and non-healthy participants. Data collection occurred from May 2022 to May 2023. The healthy participant group consisted of healthcare workers recruited from two tertiary hospitals affiliated with governmental healthcare facilities. Selection criteria for healthy participants included: (i) current employment in a healthcare setting, (ii) aged 18 and above, and (iii) absence of chronic diseases (based on self-reported responses). Non-healthy participants were recruited from four specialist clinics specializing in cardiology (heart disease), oncology (various cancers), psychiatry (depressive disorders), and nephrology (ESRD). These major diagnoses were mutually exclusive. Selection criteria for this group included: (i) current follow-up at the specified specialist clinics, and (ii) aged 18 and above. However, individuals who were unconscious, severely ill, comatose, or experiencing unstable mental conditions during the recruitment period were excluded from participation.

Ethical and regulatory considerations

This study received ethics approval from the relevant authority and also obtained prior written informed consent from research participants, prior to their participation in this study. All authors have confirmed that this study has adhered to the relevant guidelines and regulations pertaining to the reporting of experiments on humans and/or the use of human tissue samples. All authors have also strictly followed all pertinent guidelines and regulations outlined by the Medical Research and Ethics Committee (MREC), Ministry of Health, Malaysia. Ethical approval for the study was granted by the Medical Research and Ethics Committee (MREC) under NMRR ID-21-01979-XDL (IIR).

Sample size planning

The sample size statement of this study adhered to a guideline introduced in a previous study [13]. Given the objective of assessing QOL and overall well-being by using the SigQOLM across diverse groups of study participants, this study necessitates a multivariate analysis, such as Analysis of Covariance (ANCOVA), to adjust for any potential confounders in the statistical analysis. To ascertain the required sample size, an approach based on a rule of thumb for sample size determination of the General Linear Model ANCOVA was adopted. According to this guideline, a minimum sample size of 300 participants is deemed adequate for obtaining accurate estimates through ANCOVA in the target population [14]. In order to cater for the possibility of non-response, it is necessary to incorporate an additional allowance of 10% in the calculated sample size for this study, which has slightly been inflated to require a minimum of 334 participants. Eventually this study had recruited 452 participants.

Statistical analysis

Descriptive analysis was employed to outline the profile and compare the QOL and well-being among five distinct groups of study participants. Table 2 describe

status of QOL and well-being in four categories of participants. For every domain/dimension/overall, the scores were stratified into four categories such as; A: ≥80.0% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent), B: 70.0 – 79.9% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent), C: 50.0 – 69.9% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent), D: <50.0% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent) [15]. These categorizations are useful to determine the status of QOL and well-being among four different groups.

A multivariate analysis using the General Linear Model ANCOVA was conducted to compare QOL and well-being domains among the different groups, while adjusting for gender, age group, and ethnic. Post-hoc analysis employing the Least Significant Difference (LSD) test was employed for multiple comparisons of population means. All statistical analyses were carried out using SPSS software (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.).

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Results

The study population comprised 452 participants, with 284 (62.8%) classified as healthy participants and remaining are disease participants with 41 (9.1%) diagnosed with ESRD, 48 (10.6%) with cancer, 40 (8.8%) with depressive disorder, and 39 (8.6%) with heart disease. The majority of participants were female (73.0%), aged between 18 and 35 years (49.8%), and of Malay ethnicity (36.5%) (refer to Table 1).

Table 1 Profile and clinical characteristics of participants

Profile	Category	*n*	%
Gender	Male	122	27.0
	Female	330	73.0
Age group	18–35	225	49.8
	36–40	82	18.1
	41–50	78	17.3
	51–60	46	10.2
	More than 60	21	4.6
Ethnic	Malay	165	36.5
	Chinese	89	19.7
	Iban	85	18.8
	Bidayuh	80	17.7
	Melanau	11	2.4
	Others	22	4.9
Primary diagnosis	Nil	284	62.8
	ESRD	41	9.1
	Cancer	48	10.6
	Mental	40	8.8
	Heart problem	39	8.6

Status of QOL and well-being among healthy and non-healthy participants

The healthy participants experience excellent QOL and well-being in almost all the domains of SigQOLM. Out of 18 domains, 12 domains recorded status A and B while all elements recorded the same status. According to the result, patients with depressive group experience the poorest QOL and well-being reporting almost all domains with status C and D. All chronic diseases patients experience poor health with all reporting in average status of D. However, all groups reported excellent relationship except depressive group reported slightly poor relationship with average status of C. In addition, all groups reported excellent functional activities and survival domains except depressive group reported poor conditions in these two domains with average status of D (Table 2).

Table 2 Status of quality of life and well-being in four categories of participants

Domain/Dimension/	Status				
Overall	**Healthy**	**ESRD**	**Cancer**	**Depressive**	**Heart**
Pain	**B**	**D**	**D**	**D**	**D**
Physical energy	**C**	**D**	**D**	**D**	**D**
Emotional symptoms	**C**	**C**	**C**	**D**	**B**
Independent	**A**	**B**	**A**	**C**	**B**
Mobility	**A**	**C**	**A**	**A**	**C**
Sleep quality	**C**	**D**	**D**	**D**	**D**
Eating regime	**D**	**D**	**D**	**D**	**D**
Body image	**C**	**C**	**C**	**D**	**C**
Percep. on health	**C**	**D**	**D**	**D**	**D**
Health-SigQOLM	**B**	**D**	**D**	**D**	**D**
Family	**A**	**A**	**A**	**C**	**A**
Friendship	**A**	**A**	**A**	**D**	**A**
Religiosity	**A**	**A**	**A**	**C**	**A**
Relationship	**A**	**A**	**A**	**C**	**A**
Self-care	**A**	**A**	**A**	**A**	**A**
Social life	**B**	**C**	**C**	**D**	**B**
Percep. on time usage	**B**	**B**	**B**	**D**	**B**
Functional activities	**A**	**A**	**A**	**D**	**A**
Basic needs	**A**	**B**	**A**	**C**	**A**
Safety	**A**	**A**	**A**	**C**	**A**
Percep. on future	**A**	**C**	**B**	**D**	**A**
Survival	**A**	**A**	**A**	**D**	**A**
SigQOLM	**B**	**D**	**C**	**D**	**C**

Note:

A: ≥80.0% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent)

B: 70.0 – 79.9% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent)

C: 50.0 – 69.9% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent)

D: <50.0% reported the domain/dimension/overall scores ≥ 70.0% (Good & Excellent)

QOL and well-being among healthy and four groups of chronic patients

Tables 3 and 4, and Table 5 presented adjusted mean scores of SigQOLM elements and domains based on different populations. All the comparisons are found to be statistically significant with $p < 0.05$. Overall, SigQOLM elements and domains are able to discriminate between healthy versus non-healthy participants. Besides, the results have proven that disease conditions do affect both health and non-health aspects of QOL and overall well-being such as relationships, functional activities, and survival.

Discussion

This observational study successfully demonstrated the criterion validity of the SigQOLM measure through the known-groups comparison; specifically, by assessing the ability of the overall, element, and domain scores to discriminate between healthy and ill respondents. The analysis encompassed healthy participants and individuals diagnosed with four primary chronic diseases: ESRD, cancer, depressive disorders, and heart disease within the study population. Criterion validity is considered one of the most important characteristics of QOL tools [3, 16].

The SigQOLM is designed to accurately assess the generic and dynamic status of QOL and well-being, making it suitable for routine clinical practice, clinical research, and evaluating the clinical effectiveness of interventions. As a generic QOL and well-being scale, it is applicable to both healthy and non-healthy participants. Additionally, the scale observes participants' outcomes over a two-week period, acknowledging the dynamic and fluctuating nature of QOL and overall well-being according to the presenting features of different disease conditions. This duration of use aligns with that for many other QOL scales such as the MOS SF36 and WHOQOL-BREF [3, 17].

QOL and well-being

Overall, healthy participants specifically among healthcare workers showed excellent QOL and well-being. However, some aspects of health were affected, such as physical energy, emotional symptoms, sleep quality, body image, and perception of health. This can be reasonably explained by the stress, workload, and high health awareness that come with being healthcare workers in tertiary facilities [18–22]. On the other hand, the chronic patients' disease conditions not only impacted their health but also their QOL and well-being [23–27]. Therefore, these findings provide valuable insights for medical practitioners and policy makers, enabling them to tailor interventions to enhance the QOL and well-being of their patients.

Among patients with ESRD, cancer, and heart disease, only the health aspect showed poor status, while other aspects, such as relationships, functional activities, and survival, were still reported as excellent. These findings likely reflect patients in a stable condition [28]. Future studies should focus on how severe chronic conditions could possibly have an adverse impact on QOL and overall well-being. Among patients with chronic illnesses, those with depressive disorders reported the poorest QOL and well-being. The findings suggest that patients with depression shall need more support in areas such as relationships, social life, time management, basic needs of daily living, and mental health [29].

The development of the SigQOLM is grounded on the premise that an overall score should represent overall QOL and well-being, complemented by 18 specific domains. These domains collectively provide a comprehensive measurement of QOL and well-being, enhancing its validity within clinical and social contexts [2]. Hence, the study findings underscore the scientific relevance of the SigQOLM, positioning it as a suitable instrument for measuring QOL and well-being among both healthy individuals and patients. Therefore, future research discoveries should focus on expanding its utility and applicability across various populations, aiming to enhance its utility as a generic instrument for individuals regardless of their health, social and economic status.

Moving forward, the SigQOLM holds promise for use in various research settings. Interventional studies, such as clinical trials, could employ this scale to assess the impact of interventions on QOL and well-being outcomes. Likewise, observational studies, including short-term and long-term cohort studies, could utilize the SigQOLM to measure population outcomes and assess the effectiveness of the implementation of different interventions and policies for healthcare services over time. By employing the SigQOLM in future research discoveries, researchers can gain valuable insights into the QOL and well-being of individuals across many diverse populations, ultimately contributing to an improvement of the provision of care for people and elevating their overall QOL and well-being.

One of the strengths of this study is the use of a novel scale, such as SigQOLM, for measuring quality of life (QOL) and well-being. Consequently, this study is considered a pioneering effort and unique in its approach, as the scale allows both healthy and non-healthy participants to use the same instrument, facilitating meaningful comparisons [15, 30]. Additionally, the sample size is relatively large, strengthening the evidence that the estimates are likely representative of the characteristics of the target population [31].

Table 3 Association of different populations toward different domains in element of health

Domain	Group	Adj. Mean	95%CI		Post-hoc comparisons
Pain	a	78.5	74.2	82.8	b, c,d, & e
	b	51.3	44.8	57.8	a
	c	56.9	50.4	63.5	a & d
	d	43.2	35.9	50.5	a & c
	e	53.1	46.7	59.5	a & d
Physical energy	a	72.4	67.2	77.6	b, c,d, & e
	b	40.5	32.6	48.5	a & e
	c	45.3	37.8	52.8	a
	d	38.2	29.3	47.1	a & e
	e	55.0	47.2	62.9	a, b, & d
Psychological symptoms	a	83.6	78.9	88.4	b & d
	b	75.1	67.9	82.3	a & d
	c	79.6	72.5	86.6	d
	d	38.1	30.1	46.2	a, b,c, & e
	e	79.0	71.9	86.2	d
Independent	a	94.2	90.2	98.1	b, d, & e
	b	79.3	73.3	85.2	a, c, & d
	c	88.4	82.7	94.2	b & d
	d	70.3	63.6	77.0	a, b,c, & e
	e	83.4	77.5	89.3	a & d
Mobility	a	92.4	89.1	95.8	b, c,d, & e
	b	76.1	71.0	81.1	a & d
	c	81.8	76.9	86.6	a
	d	82.8	77.0	88.5	a, b, & e
	e	78.8	73.8	83.7	a & d
Sleep	a	71.7	66.5	77.0	b, c, & d
	b	59.9	51.9	67.9	a & d
	c	61.4	53.8	69.0	a & d
	d	35.3	26.3	44.2	a, b,c & e
	e	62.9	55.0	70.8	d
Eating regime	a	60.7	54.5	66.9	b, c, & e
	b	28.1	18.7	37.6	a, d, & e
	c	39.3	30.3	48.3	a
	d	52.0	41.5	62.6	b
	e	48.1	38.6	57.6	a & b
Body image	a	72.5	66.0	79.0	d
	b	73.1	63.2	82.9	d
	c	74.4	64.9	83.8	d
	d	46.1	35.1	57.1	a, b,c & e
	e	66.5	56.6	76.4	d
Perception of future health	a	76.4	70.6	82.2	b, c,d, & e
	b	48.4	39.5	57.2	a
	c	58.5	50.1	67.0	a & d
	d	43.9	34.0	53.8	a, c, & e
	e	58.2	49.3	67.1	a & d

Note:

[a]Primary diagnosis = Nil (Healthy)

[b]Primary diagnosis = End Stage Renal Disease

[c]Primary diagnosis = Cancer

[d]Primary diagnosis = Depressive disorders

[e]Primary diagnosis = Heart disease

Adj. mean = Adjusted mean after control for gender, age group and ethnics in the analysis

CI = confidence interval

Table 4 Association of different populations toward different domains in elements of relationships, functional activities, and survival

Domain	Group	Adj. Mean	95%CI		Post-hoc comparisons
Family	a	96.3	93.1	99.4	c, d, & e
	b	92.6	87.9	97.4	d
	c	90.8	86.1	95.4	a & d
	d	77.0	71.6	82.4	a, b,c, & e
	e	86.3	81.6	91.0	a & d
Friendship	a	91.8	88.6	95.1	d
	b	87.2	82.3	92.2	d
	c	90.7	85.9	95.5	d
	d	72.0	66.4	77.6	a, b,c, & e
	e	87.9	83.0	92.9	d
Religiosity	a	89.4	85.6	93.2	d
	b	87.6	81.9	93.4	d
	c	86.7	81.1	92.3	d
	d	70.6	64.1	77.0	a, b,c, & e
	e	83.6	77.9	89.3	d
Self-care	a	97.2	94.7	99.7	b, d, & e
	b	89.4	85.6	93.2	a, c, & d
	c	94.9	91.3	98.5	b & d
	d	82.6	78.4	86.8	a, b,c, & e
	e	90.3	86.5	94.1	a & d
Social life	a	79.9	75.8	84.0	d
	b	77.4	71.1	83.6	d
	c	78.1	72.0	84.1	d
	d	50.3	43.3	57.4	a, b,c, & e
	e	79.6	73.4	85.7	d
Perception on time usage	a	85.9	82.1	89.8	d
	b	84.7	78.9	90.5	d
	c	80.7	74.9	86.5	d
	d	60.9	54.4	67.4	a, b,c, & e
	e	80.9	75.1	86.6	d
Basic needs	a	95.2	92.0	98.3	b, c,d, & e
	b	88.0	83.2	92.8	a & d
	c	89.0	84.4	93.5	a & d
	d	75.8	70.4	81.1	a, b,c, & e
	e	85.6	80.8	90.4	a & d
Safety	a	95.2	92.1	98.4	d & e
	b	92.0	87.2	96.8	d & e
	c	94.1	89.5	98.7	d & e
	d	78.2	72.8	83.5	a, b, & c
	e	82.7	77.9	87.5	a, b, & c
Perception on future condition	a	92.1	88.3	95.9	b, c,d, & e
	b	73.6	67.8	79.3	a, c,d, & e
	c	81.9	76.3	87.5	a, b, & d
	d	58.0	51.5	64.5	a, b,c, & e
	e	83.2	77.4	88.9	a, b, & d

Note:

[a]Primary diagnosis = Nil (Healthy)

[b]Primary diagnosis = End Stage Renal Disease

[c]Primary diagnosis = Cancer

[d]Primary diagnosis = Depressive disorders

[e]Primary diagnosis = Heart disease

Adj. mean = Adjusted mean after control for gender, age group and ethnics in the analysis

CI = confidence interval

Table 5 Association of different populations toward different domains in main elements of SigQOLM

Domain	Group	Adj. Mean	95%CI		Post-hoc comparisons
Health	a	78.7	75.4	82.0	b, c,d, & e
	b	60.1	55.1	65.0	a & d
	c	65.9	60.6	71.1	a & d
	d	49.8	44.1	55.5	a, b,c, & e
	e	64.7	59.6	69.7	a & d
Relationship	a	92.3	89.7	94.9	d & e
	b	89.0	85.0	92.9	d
	c	89.4	85.5	93.3	d
	d	73.4	68.9	77.9	a, b,c, & e
	e	85.9	82.0	89.8	a & d
Functional activities	a	88.9	86.3	91.6	d & e
	b	84.9	80.9	88.9	d
	c	85.4	81.5	89.4	d
	d	66.8	62.3	71.4	a, b,c, & e
	e	84.0	79.9	88.0	a & d
Survival	a	94.1	91.4	96.9	b, c,d, & e
	b	84.2	80.0	88.3	a & d
	c	88.5	84.5	92.6	a & d
	d	70.5	65.8	75.2	a, b,c, & e
	e	83.6	79.4	87.8	a & d
Overall SigQOLM	a	77.8	75.5	80.2	b, c,d, & e
	b	67.6	64.1	71.2	a & d
	c	71.1	67.2	74.9	a & d
	d	56.2	52.1	60.3	a, b,c, & e
	e	68.7	65.2	72.2	a & d

Note:

[a]Primary diagnosis = Nil (Healthy)

[b]Primary diagnosis = End Stage Renal Disease

[c]Primary diagnosis = Cancer

[d]Primary diagnosis = Depressive disorders

[e]Primary diagnosis = Heart disease

Adj. mean = Adjusted mean after control for gender, age group and ethnics in the analysis

CI = confidence interval

Limitations of study

It's important to acknowledge the limitations of the study. All patients are in a stable condition. Thus, this study might not be able to recruit patients who are in a severe condition or whose conditions are deteriorating rapidly. Besides, the sample of disease participants is small. Nevertheless, the results were demonstrated to reach statistical significance which can therefore lend support to the fact that there is sufficient statistical power to test the hypotheses for this study.

Conclusion

The SigQOLM is a versatile tool designed to measure QOL and overall well-being, and this study has found that it exhibits sufficient sensitivity in distinguishing between healthy and non-healthy study participants. Generally, healthy participants reported to experience an excellent QOL and overall well-being. However, disparities in QOL and well-being were clearly evident among patients with various clinical diagnoses. These findings provide valuable insights for medical practitioners and policy makers, enabling them to tailor interventions to enhance the QOL and overall well-being of their patients.

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Author contributions

MAB, WHL, SR, and XTT initiated and designed the study. MAB, YKH, XTT, and CHC conducted the literature review. EPPY, ARJK, YYHJ, NFDA, CHHT, KSY, FJ, AYYF performed data collection. MAB, and MH conducted statistical analyses. MAB, and YKH drafted the article. All authors read, reviewed, and approved the final manuscript.

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Data availability

Formal data request must be made from the Director-General of the Malaysian Ministry of Health. This request can be made via the corresponding author. Once granted the approval by the Director-General of the Malaysian Ministry of Health, the anonymous data can be made available.

Declarations

Ethics approval and consent to participate

This study received ethics approval and obtained prior written consent from research participants. Only individuals who had given their written informed consent would be eligible for participation in the study. Ethical approval for this study was granted by the Medical Research and Ethics Committee (MREC), Ministry of Health, Malaysia under the registration number of NMRR ID-21-01979-XDL (IIR). All the authors of this paper have confirmed that this study has adhered to the relevant guidelines and regulations pertaining to the reporting of experiments on humans and/or the use of human tissue samples.

Consent for publication

We have obtained the formal approval for publication of this article from the Director-General of the Ministry of Health, Malaysia. Therefore, we thank the Director-General of Health of the Ministry of Health, Malaysia for his kind permission to publish these findings.

Competing interests

The authors declare no competing interests.

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