SYSTEMATIC REVIEW

Quality of life on type 2 diabetes patients in Indonesia: Systematic review

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Abstract

Objective: To review various quality of life questionnaires related to patients of type 2 diabetes mellitus.

Method: The systematic review comprised search on SAGE, PubMed, ProQuest, Ebsco and Google Scholar databases for studies using quality of life questionnaires related to patients of type 2 diabetes mellitus published between January 2012 and January 2022 in either English or Bhasha language. Data extraction and assessment was done in line with the Preferred Reporting Items for Systematic Reviews and Meta-analyses checklist.

Results: Of the 25 studies reviewed, 23(92.2%) were in the English language. They were conducted in 17(51.5%) of the 33 provinces in Indonesia. The questionnaires used were 36-item Short Form 8(32%), EuroQol 5-dimension 5-level scale 6(24%), World Health Organisation Quality of Life-Brief version 6(24%), Diabetes Quality of Life 3(12%) and Diabetes Quality of Life Clinical Trial Questionnaire 2(8%). Variables associated with the quality of life of the diabetics included education, gender and age. The internal factors included glycaemic control, psychological condition, self-efficacy, perception of illness, self-care management, medication adherence, neutrophil-lymphocyte ratio and complications. The external factors included family support, medication counselling and pharmacists' intervention**.**

Conclusions: Many instruments measure quality of life related to patients of diabetes mellitus. Countries with different socio-cultural forms have different quality of life perspectives, and the assessment tool should be picked accordingly.

Keywords: Diabetes mellitus, Glycaemic, Neutrophils, Pharmacists, Self-efficacy, Surgical mesh, Medication adherence, Lymphocytes. (JPMA 73: S-140 [Suppl. 2]; 2023) **DOI: https://doi.org/10.47391/JPMA.Ind-S2-33**

Introduction

In Indonesia, the number of diabetes mellitus (DM) patients is rising and the issue is exacerbated by complications which arise due to various factors, including a lifelong treatment process that causes DM patients to feel tired and stressed, and the burden of life increases so that they experience disturbances in biological, psychological, social and spiritual aspects that ultimately reduce the patient's quality of life (QOL).[1] Complications of DM can be classified as microvascular and macrovascular and they can worsen QOL of DM patients.[2]

In a study, male DM respondents felt better QOL compared to women, especially in the areas of vitality and pain. Patients with comorbidities (93.64%) had lower quality of life scores in all domains.[3] In another study, DM patients were found to have port overall QOL.[4] Decreased QOL in DM patients can cause discomfort, anxiety, more severe pain, impaired glycaemic control, loss of independence, loss of body function, premature death, and stress in the family.[2]

QOL is the perception of an individual's position in life based on values and culture where they live in accordance with their purpose of life, expectations and standards. There are four QOL domains; physical health, psychological state, social relationships, and the environment. There are more than five instruments for assessing QOL.[5] In addition to the complicating factors, the causes of decreased QOL in DM patients are anxiety, depression and sleep disorders.[6,7] The important predictors affecting QOL are age, gender, marital status, illness duration and fasting blood sugar (FBS) levels.[8]

The current systematic review was planned to analyse the use of various QOL questionnaires related to patients of type 2 DM (T2DM).

Material and methods

The systematic review comprised search on SAGE, PubMed, ProQuest, Ebsco and Google Scholar databases for studies using QOL questionnaires related to patients of T2DM published between January 2012 and January 2022. The eligibility of the studies was based on the patient, intervention, comparison, outcome and time (PICOT) framework.[9] Key words used for the search were quality of life or QOL, life quality, or health-related quality of life, diabetes or diabetes mellitus type 2 or DM type 2, T2DM or type 2 diabetes.

The studies included were original articles having quantitative component published in English and Bahasa languages in peer-reviewed journals, and whose full text

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was available. Those not meeting the inclusion criteria as well as duplicates were excluded. The review was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline.[10]

Results

Of the 2082 articles initially found, 25(1.2%) were reviewed (Figure 1).[9-16,19,21-24,26-31,34-36,39,47,48] Of them, 23(92.2%) were in the English language, and 22(88%) had a cross-sectional design. The studies were conducted in 17(51.5%) of the 33 provinces in Indonesia.

The questionnaires used were 36-item Short Form (SF-36) 8(32%), EuroQol 5-dimension 5-level (EQ5D5L) scale 6(24%), World Health Organisation Quality of Life-Brief version (WHOQOL-BREF) 6(24%), Diabetes Quality of Life (DQOL) 3(12%) and Diabetes Quality of Life Clinical Trial Questionnaire (DQOLCTQ) 2(8%) (Figure 2).

In 8(32%) studies, patients with lower levels of education and female gender had worse QOL scores. Variables associated with the QOL of T2DM patients included education, gender and age. The internal factors included glycaemic control, psychological condition, self-efficacy, perception of illness, self-care management, medication adherence, neutrophil-lymphocyte ratio (NLR) and complications. The external factors included family support, medication counselling and pharmacists' intervention (Table).

Table-1: Characteristic Studies Included in Review.

No	Title	Authors	Year	Language	Province	Study Design	Sample Characteristics		QOL	
							Sample size	Age range	Instrument	Related factors
1	Effect of Self-Regulated Learning for Improving Dietary Management and Quality of Life in Patients with Type-2 Diabetes Mellitus at Dr. Ramelan Naval Hospital, Surabaya, Indonesia.[33]	Yayuk Estuningsih, Thinni Nurul Rochmah, Merryana Andriani, Trias Mahmudiono	2019	English	Surabaya, East Java	A quasi-experimental study with two groups	20	40-59 year	Quality of Life - BREF questionnaire	Self-regulated learning
2	Emotional Distress is Associated with Lower Health-Related Quality of Life Among Patients with Diabetes Using Antihypertensive and/or Antihyperlipidemic Medications: A Multicenter Study in Indonesia.[21]	Hak et al.	2021	English	Bandung, Samarinda, and Yogyakarta	A multi-center cross-sectional survey	503	≥18 year	EQ-5D-5L	emotional distress,
3	Health-related quality of life in Indonesian type 2 diabetes mellitus outpatients measured with the Bahasa version of EQ-5.[48]	Arifin et al.	2019	English	South Sulawesi, Central Sulawesi, Central Java, West Java	A cross-sectional study	907	≥18 years	EQ-5D-5L	Sex: Female, Tingkat pendidikan, treatment in secondary care, dependency on caregivers, not undergoing DM Type 2 therapies and being a housewife
4	Quality of Life among Patients with Type 2 Diabetic Mellitus in Out Patient Department, General Public Hospital, West Java.[28]	Puspasari susy	2021	English	West Java	A cross-sectional survey	73	Adult aged	WHOQOL-BREF	Sex: Female, Duration of diabetes, education level, income, macrovascular complications, older age >45 years

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No	Title	Authors	Year	Language	Province	Study Design	Sample Characteristics		QOL	
							Sample size	Age range	Instrument	Related factors
5	Synergistic Effect of Low Neutrophil– Lymphocyte Ratio With Physical Activity on Quality of Life in Type 2 Diabetes Mellitus: A Community-Based Study.[11]	Rias et al.	2020	English	East Java	cross-sectional study	294	17–79 years	36-item Short Form Survey (SF-36)	Physical activity, Neutrophil-Lymphocyte Ratio
6	The differences in health-related quality of life between younger and older adults and its associated factors in patients with type 2 diabetes mellitus in Indonesia.[12]	Yunita Sari , Atyanti Isworo, Arif Setyo Upoyo, Agis Taufk, Rahmi Setiyani, Keksi Girindra Swasti, Haryanto Haryanto, Saldy Yusuf, Nasruddin Nasruddin and Ridlwan Kamaluddin	2021	English	Central Java	A cross-sectional study	641	younger adult (≥18 -64 years old) Older adult (≥65	36-item Short-Form Health Survey (SF-36)	HRQOL younger adult; Education level, employment status, complications, diabetes self-management, diabetes distress, depression and self-efficacy and HRQOL in older adult; income, depression, diabetes distress, and self-efficacy
7	Comparison quality of life patients treated with insulin and oral hypoglycaemic drugs.[13]	A W Harahap and M S Nasution	2018	English	North Sumatera	A cross-sectional study	80	>18 year	36-item Short-Form Health Survey (SF-36)	Education level, employment status, The quality of life of patients using insulin therapy is better than those using OHD.
8	Relationship between emotional distress and quality of life on type 2 diabetes mellitus patients in Meranti island regency hospital.[23]	I N Faridah, D A Perwitasari, M Pusfita, H Jasman	2017	English	Riau	A cross-sectional study	80	>18 year	EQ-5D-5L	Education level, employment status, and emotional distress
9	Relationship between family support with quality of life among type 2 diabetes mellitus patients at Amplas primary health care in Medan, Indonesia.[29]	R Amelia, AS Wahyuni, R A Ariga, Felicia and Preveena	2018	English	North Sumatera	Across-sectional study	100	35-65 years	36-item Short-Form Health Survey (SF-36)	Family support
10	Relationship of therapeutic outcome with quality of life on type 2 diabetes mellitus patients in Abdul Azis Singkawang hospital.[25]	D A Perwitasari, S Urbayatun, I N Faridah, N Masyithah	2017	English	West Kalimantan	A cross-sectional study	86	>18 year	36-item Short-Form Health Survey (SF-36)	Family support
11	Treatment Adherence and Quality of Life in Diabetes Mellitus Patients in Indonesia.[24]	D. A. Perwitasari and S. Urbayatun	2016	English	Yogyakarta	A cross-sectional study	65	mean age 57.69 ± 11.41 years old	The Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ)	Quality of care, Sex, age and patients adherence
12	Impact of pharmacist counselling on health-related quality of life of patients with type 2 diabetes mellitus: a cluster randomized controlled study.[26]	Fajriansyah, Aulia Iskandarsyah, Irma M Puspitasari, Keri Lestari	2020	English	South Sulawesi	This cluster randomized controlled trial was designed to include two groups (the control and intervention groups)	220	<50-65 years	EQ-5D-5L	Pharmacist counselling

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No	Title	Authors	Year	Language	Province	Study Design	Sample Characteristics		QOL	
							Sample size	Age range	Instrument	Related factors
13	Impact of Pharmacist Intervention on Improving the Quality of Life of Patients with Type 2 Diabetes Mellitus.[15]	Syarifuddin et al.	2019	English	North Sumatera	Analytical cohort design	45	>46 years	36-item Short-Form Health Survey (SF-36)	Pharmacist Intervention
14	The Model of Self-Care Behaviour and the Relationship with Quality Of Life, Metabolic Control and Lipid Control of Type 2 Diabetes Mellitus Patients in Binjai City, Indonesia.[29]	Rina Amelia	2018	English	North Sumatera	A cross-sectional study	115	40-65 years	WHOQoL-BREF questionnaire	Model of Self Care Behaviour consist of knowledge, attitudes, communication, financing, family support, motivation, and self-efficacy
15	Quality of life and glycaemic profile of type 2 diabetes mellitus patients of Indonesian: a descriptive study.[30]	R Amelia et al.	2018	English	North Sumatera	A cross-sectional study	115	>21 years	WHOQoL-BREF questionnaire	Sex: female. Duration of treatment and glycaemic profile (blood sugar level and HbA1C)
16	Distress Adherence and Quality of Life of Type 2 Diabetes mellitus patients in Indonesia.[49]	Dyah Aryani Perwitasari, et al.	2019	English	West Kalimantan and Jayapura	A cross-sectional study	231	>18 year	EQ-5D-5L	Diabetes distress and patient adherence
17	Religious Coping, Medication Adherence and Quality Of Life For Diabetes Mellitus Patients.[31]	Putra, M. M., Mariani, K. S., & Ratnadi, N. Y. A	2021	English	Bali	Across-sectional study	154	NA	WHOQOL-BREF	Religious coping, medication adherence and motivation
18	Illness Perception and Quality of Life in Type 2 Diabetes Mellitus Patients in Lampung, Indonesia.[16]	Hasanul K. Al-Kayyis & Dyah A. Perwitasari	2018	English	Lampung	A cross-sectional study	110	15-65 years	36-item Short Form Survey (SF-36)	Illness perception
19	Association between Blood Pressure and Quality of Life of Patients with Diabetes Mellitus Type 2 in the Bogor City Indonesia.[36]	Sitorus N, Suriani O, Suryaputri IY, Purba FD, Hanafi AS	2022	English	West Java	A cross-sectional study	144	>25 years	DM QoL modification questionnaire	Marital status, education level, blood pressure
20	Sociodemographic Characteristic and Health Related Quality of Life in Outpatients of Type 2 Diabetes Mellitus under JKN[41]	Restinia et al.	2015	English	Jakarta	A cross-sectional study	83	≥ 45 years	Diabetes quality of life clinical trial questionnaire (DQLCTQ)	Education level
21	Path Analysis on the Biopsychosocial and Economic Determinants of Quality of Life in Patients with Type II Diabetes Mellitus: Evidence from Surakarta, Central Java.[37]	Nurvitasari RI, Tamtomo DG, Dewi YLR	2020	English	Central Java	A cross-sectional study	100	mean age 61.5 ± years old	The measuring instrument was the Diabetes Quality of Life (DQOL) questionnaire with the version of The Revised Version of DQOL (RV-DQOL).	HbA1c levels, family support, education, occupation, physical activity.
22	Relationships Between Family Support and Self-Care To The Quality of Life of Patients With Type II Diabetes Mellitus at Puskesmas Kabaena Barat, Bombana[32]	Dewi Ulfani, Safruddin, Sudarman	2020	English	Southeast Sulawesi	A cross-sectional study	35	>15 years	WHOQOL-BREF	Depression, family support, self-care

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No	Title	Authors	Year	Language	Province	Study Design	Sample Characteristics		QOL	
							Sample size	Age range	Instrument	Related factors
23	The Relationship of Health Behaviour with the Area of Sugar Content and Quality of Life of Diabetes Patients.[38]	Sasmiyanto	2019	Bahasa	East Java	A cross-sectional study	100	31-70 years	DQOL (Diabetes Quality of Life)	Health Behaviour
24	The Effect of Outcome Therapy to the Quality of Life Type 2 Diabetes Mellitus Patient on West Nusa Tenggara Hospital, Indonesia.[17]	Adikusuma W, Nopitasari BL	2019	English	West Nusa Tenggara	A cross-sectional study	60	45-65 years	SF 36 questionnaire	HbA1c levels, fasting blood glucose (FGB), Outcome Therapy
25	Correlation of Fasting Blood Sugar Levels on Quality of Life in Diabetes Mellitus Type 2 Patients at Primary Health Care in West Jakarta 2018.[18]	Nanda Aula Rumana, Laras Sitoayu, Mertien Sa'pang	2018	Bahasa	Jakarta	A cross-sectional study	146	30-50 years	SF-36 questionnaire	Fasting blood glucose

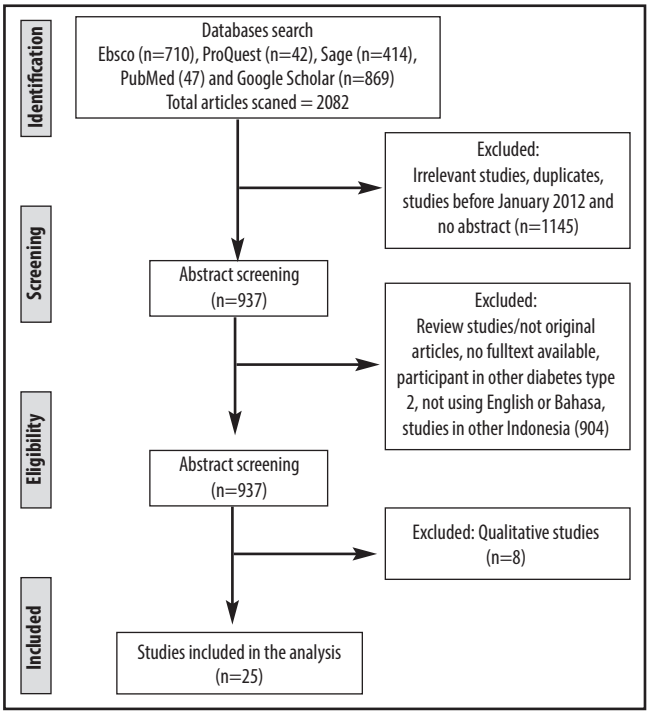
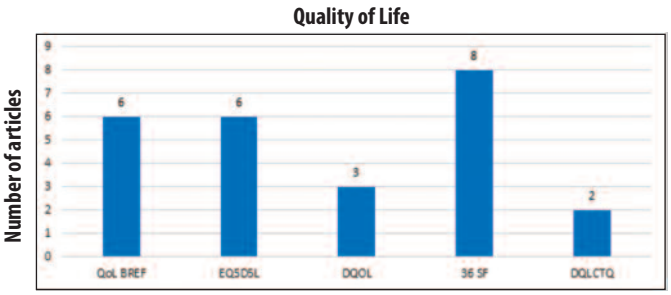


Figure-1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.



QOL-BREF: Quality of Life-Brief version, EQ5D5L: EuroQol 5-dimension 5-level scale, DQOL: Diabetes Quality of Life, 36SF: 35-item Short Form, DQLCTQ: Diabetes Quality of Life Clinical Trial Questionnaire

Figure-2: Number of studies with respect to the quality-of-life instrument used.

Discussion

The systematic review found that 8 studies used SF-36 to assess QOL in T2DM patients[11–18]. SF-36 is a generic instrument with good validity and reliability. The performance of component scores and each dimension can, however, vary depending on populations and research design.[19] Dimensions of the SF-36 are physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Many publications in reputable journals and international research have used SF-36 to measure QOL, but the validity of the total health-related score is questionable because it can give biased results.[20]

There were 6 studies that used EQ5D5L scale.[21–26] The dimensions of the scale are mobility, self-care, pain/discomfort, and anxiety/depression, with ratings of 'no problem', 'some problem' and 'extreme problem'. The EQ5D5L and EQ5D3L questionnaires have clear psychometric advantages across multiple dimensions.[27]

Six of the studies used WHOQOL-BREF.[28–33] Its domains are physical health, psychological, social relationships and environment.[34] The validity score for all the domains is 0.93 and for each domain it ranges from 0.69 to 0.86, with total average score of 12.8.[35]

Three of the studies used DQOL.[36–38] The revised version of the DQOL instrument was developed with satisfaction, impact and worry domains consisting of 13 items.

Reliability is very good with satisfaction domain values 0.92 and 0.84, impact domain values 0.98 and 0.60 and worry domain values 0.99 and 0.57.[39] Indonesian Asian DQOL questionnaire is a valid and reliable tool to measure QOL of T2DM patients in Indonesia.[40]

Two studies used DQLCTQ[24,41] which was developed by the United Kingdom Prospective Diabetes Study (UKPDS) to assess QOL in diabetes patients. The DQLCTQ consists of eight domains: physical function, energy/fatigue, health distress, mental health, satisfaction, treatment satisfaction, treatment flexibility, and symptoms frequency. Total scores ranges 0-100, with higher scores indicating a better QOL.[42] The revised version (DQLCTQ-R) is a very suitable health-related QOL (HRQOL) instrument for evaluating the effectiveness of new diabetes treatments in type 1 and 2 patients, and it has been found to reliable, valid and comprehensive in multinational clinical trials[24].

Based on 25 studies, the current review found that T2DM reduces QOL. Most of the sociodemographic associations with a decrease in QOL related to low levels of education, female gender and older age. Other factors included glycaemic control, psychological condition, self-efficacy, perception of illness, self-care management, medication adherence, NLR and complications. External factors included family support, medication counselling and pharmacist intervention**.** In general, such related factors were in line with international reviews.[43,44]

Social support and family support have a significant correlation with QOL[45] and similar is the case with pharmaceutical care programmes.[46] Health education plays an important role in the prevention and control of diabetes and its complications. Pharmacist-mediated patient counselling can greatly affect knowledge, attitude, practice, glycaemic control and, hence, can improve QOL.[47]

The current review has limitations as it comprised <30 studies which were conducted in only 17 of the 33 provinces in Indonesia. Also, most of the studies reviewed had a cross-sectional design.

Conclusion

The most used questionnaire to assess QOL in T2DM patients in Indonesia was found to be the SF-36. In general, the association between variables and QOL in the reviewed Indonesia studies were in line with international reviews**.**

Limitation: The review was not registered with the Prospective Register of Systematic Reviews (PROSPERO), which is a limitation.

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