Health and Quality of Life Outcomes

REVIEW

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Concept analysis of diabetes-related quality of life

Anggi Lukman Wicaksana[1,2*] and Nuzul Sri Hertanti[3]

Abstract

Background Quality of life (QoL) is a common indicator of outcomes in people living with diabetes, but the concept of diabetes-related QoL (DRQoL) remains unclear. Clarifying core knowledge of DRQoL was the goal of this paper.

Methods A concept analysis was conducted according to Walker and Avant's framework. A systematic search of the published literature was conducted between 2002 and 2022 based on resource availability, current relevancy, and the quality of recent studies. Three major databases were used to identify the attributes, antecedents, consequences, and measures for DRQoL. Only articles investigating DRQoL among adult or elderly people living with diabetes that were published in English in peer-reviewed journals were analyzed.

Results In total, 4342 articles were screened, and only 401 articles underwent eligibility assessment. A total of 183 articles were included in the analysis. Most (59.78%) of them were observational studies and DRQoL as a primary outcome. We identified four critical components of DRQoL: (a) general health, (b) diabetes-related satisfaction, (c) diabetes impact, and (d) diabetes self-management. The antecedents were classified according to their contributions to DRQoL as follows: 25 positive-induced, 4 neutral-based, and 19 negative-induced antecedents. The consequences of DRQoL were mortality risk, personal health, satisfaction with health care, hospitalization risk, and failure to return to work. The referents varied widely, and 32 tools were found for DRQoL measurement. Furthermore, 12 scales for disease-specific DRQoL and 17 tools for general QoL were identified.

Conclusion This paper provides a definition of DRQoL as well as its attributes, antecedents, consequences, and measures in adults with diabetes. The attributes of DRQoL included general health, diabetes-related satisfaction, diabetes impact, and diabetes self-management. A comprehensive understanding of DRQoL can improve the quality of care and can aid in the recognition of the needs of care among people living with diabetes.

Keywords Concept analysis, Diabetes, Diabetes care, Diabetes impact, Health-related quality of life, Self-management, Quality of life

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Background

Quality of life (QoL) is a broad concept and is a measure of outcomes in people with chronic medical conditions, including those living with diabetes. Although only 21% of diabetes-related clinical trials have thus far reported on the QoL of the included patients [1], recent clinical trials have paid increasing attention to this topic. Researchers have argued that the measurement of QoL in people living with diabetes is as essential as the measurement of their biological outcomes (i.e., glycated hemoglobin and glucose variability) [2, 3]. Accumulating evidence suggests that QoL is an essential core outcome among people living with type 1 and type 2 diabetes [2, 4].

QoL is considered a patient-reported or patient-important outcome in people living with diabetes [1]. Questionnaires measuring general QoL are commonly used in studies of the diabetes population [5, 6]. Because people with diabetes have unique care needs and outcomes, a general QoL questionnaire may not be sensitive and specific enough to detect QoL changes in this population. The concept of QoL has been discussed in the general population [7, 8], older people [9], and people living with diseases such as chronic illness [10], cancer [11], renal disease [12], and chronic obstructive pulmonary disease [13]. For general population, the QoL is characterized by key elements such as subjective and objective evaluations of life and overall life satisfaction [7, 8]. In contrast, the QoL for older adults is primary conceptualized in terms of subjective wellfare and self-actualization, and life satisfaction [9]. Conversely, the QoL for young adults living with chronic diseases encompases subjective, dynamic, multidimentional aspects of life, pursuit of ambitions, and diseases related constraints [10]. These definitions and attributes of QoL are both distinctive and typical. However, given the specific needs of diabetes care outcome [1, 2, 4], the broad QoL concept to the general population, older adults, and people living with other conditions may not be suitable for people living with diabetes. To the best of our knowledge, no study has clearly defined QoL in the diabetes population thus far. There is a need to redefine QoL for people living with diabetes. Therefore, identifying the definition and critical components of diabetes-related QoL (DRQoL) is of research interest and clinical relevance.

This study aimed to expand the core knowledge of DRQoL and differentiate it from general QoL through a concept analysis of available evidence. In particular, we aimed to identify the specific attributes, antecedents, consequences, and measures of DRQoL. Our results may facilitate a comprehensive understanding of DRQoL and may aid in the development of efficient approaches to improve QoL in adult people living with diabetes.

Methods

We used Walker and Avant's framework to guide this concept analysis of DRQoL. Walker and Avant's framework is selected because it provides clear steps and philosophical understanding for analyzing the concept under study, and it has been widely used to clarify concepts [14].

Literature search

A systematic search was conducted using the PubMed, Science Direct, and Medline (via EBSCOhost) databases. The following Medical Subject Heading (MeSH) terms with Boolean operators and controlled vocabulary were used to search for relevant studies: quality of life, health-related quality of life, diabetes mellitus, patients, adult, aged (Table 1). Manual searching of additional resources was then conducted. The inclusion criteria were: (1) articles that focused on and discussed QoL in the titles, abstracts, or main texts; (2) articles addressing adults or older adults living with diabetes; (3) articles published between 2002 and 2022; (4) articles available in full text in English; and (5) articles that were either original or review articles. We limited our search to the past 20 years and to English-only articles due to resource availability, work efficiency, and contemporary relevancy. Moreover, we considered the quality of recent studies and focused on current trends in DRQoL articles. Exclusion criteria were: (1) unpublished works, (2) editorial letters, (3) commentaries, and (4) conference papers.

Steps of concept analysis using walker and Avant's framework

The analysis was performed following Walker and Avant's framework [15], which comprised the following steps: (1) concept selection, (2) determination of the analysis aims, (3) identification of possible uses of the concept, (4)

Table 1 Example systematic search strategy in the pubmed database

Step	Keywords
1	Quality of life or quality of life.tiab or health related quality of life.tiab quality of life.tw
2	Diabetes mellitus or diabetes mellitus.tiab or diabetes.tiab or diabetes mellitus.tw
3	Patients or persons
4	Adult or aged
5	1 and 2 and 3 and 4
6	Limit 5 to year = 2002–2022
7	Limit 6 to human and English only

determination of the defining attributes, (5) identification of model cases, (6) construction of additional cases, (7) identification of antecedents and consequences, and (8) definition of empirical referents.

Data extraction and analysis

Our analysis focused on the uses of the concept of DRQoL and the attributes, antecedents, consequences, and measures for DRQoL. To identify the attributes, antecedents, consequences, and measures for DRQoL, two authors independently extracted the data from each article by using a Microsoft Excel spreadsheet. Authors extracted the data as follow: titles, authors, year of publication, country, region, research design, samples, types of diabetes, whether QoL as primary or secondary outcome, critical points for the concept analysis, and contribution for attributes, antecedents, consequences, and measures (Supplementary Table 1). Any disagreements were resolved by a discussion between the two authors. The outcomes were presented in a table extraction.

Results

In the present study, we selected DRQoL among adults living with diabetes as the main concept. Our literature search resulted in 4,351 articles from the three databases. After excluding 17 duplicate articles using EndNote X9 software and through screening based on the eligibility (inclusion and exclusion) criteria, we included 183 articles in our final analysis (Fig. 1).

Characteristics of included studies

Most of the articles were from American countries ($n = 62$, 33.88%), followed by European, Asian, Middle Eastern, Oceania, and African countries (28.41%, 24.04%, 5.46%, 3.82%, and 2.73%, respectively).

Approximately half of the articles ($n = 109$; 59.56%) were observational studies, and the remaining were experimental studies, secondary analyses, reviews and meta-analyses, and qualitative research (27.87%, 6.01%, 4.37%, and 2.18%, respectively)—with the majority of the articles (79.66%) listing QoL as the main primary outcome. Supplementary Tables 1 and 2 present the extracted data as well as a summary of DRQoL antecedents, attributes, consequences, and referents from the literature.

Possible use of DRQoL concept

In the MeSH terminology from the PubMed database, QoL at the medical and health area is defined as "a generic concept reflecting concern with modification and enhancement of life attributes" [16]. In addition, the World Health Organization (WHO) QoL group defines QoL for general population as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" [17]. In the field of social sciences and psychology, QoL refers to multifaceted aspects, including cultural, behavioral, and social factors that influence how individuals perceive their goodness and well-being [18, 19]. In economics and human development, QoL focuses on the gap between expections and reality of life. It encompasses factors such as income, consumption patterns, and job satiffaction [19, 20]. These definitions adequately describe the concept of QoL in general, but they do not specifically explain DRQoL. Based on the current and available evidences, DRQoL can be defined as "patients' perception and/or personal appraisal in regard to the life, satisfaction, and major interest in the context of diabetes care while living with diabetes." Personal appraisal and reflection on living with diabetes align with the definition of QoL in general population [16, 17]. However, this judgment is largely influenced by diabetes care and management, a major factor affecting the health of people living with diabetes [5, 21–26]. Diabetes care and management includes, but is not limited to, activities such as glucose monitoring, dietary management, physical activity, diabetes education, stress management, medication administration, insulin therapy, and behavioral modification.

Defining the attributes of DRQoL

Next, we identified the attributes of DRQoL as critical components or characteristics of DRQoL; these attributes differentiate it from other concepts [15]. The attributes were drawn from the domains, subdomains, scales, or subscales of the available DRQoL tools. A total of 21 domains, subdomains, and subscales were initially extracted and then classified into four major attributes: general health, diabetes-related satisfaction, diabetes impact, and diabetes self-management (Table 2; Fig. 2). The classification used similar approach of content analysis and consultation to diabetes experts, which then revealed the four categories.

People living with diabetes might appraise their general health status based on their QoL. Here, general health refers to individuals' judgment of their health conditions [7]. Current health condition is subjective impression about their overall health living with diabetes that affects their QoL. Patients may require to response question "How do you describe your overall health regarding the current quality of life?" Then, they can adjust their overall health status based on their individual perception. Previous studies had identified general health status as one of key components of DRQoL [21, 22]. Tietjen et al. [21] described that more than 50% of Palestanian people living with diabetes reported good and very good QoL.

Because diabetes is a chronic disease, all patients require diabetes care and consequently report their

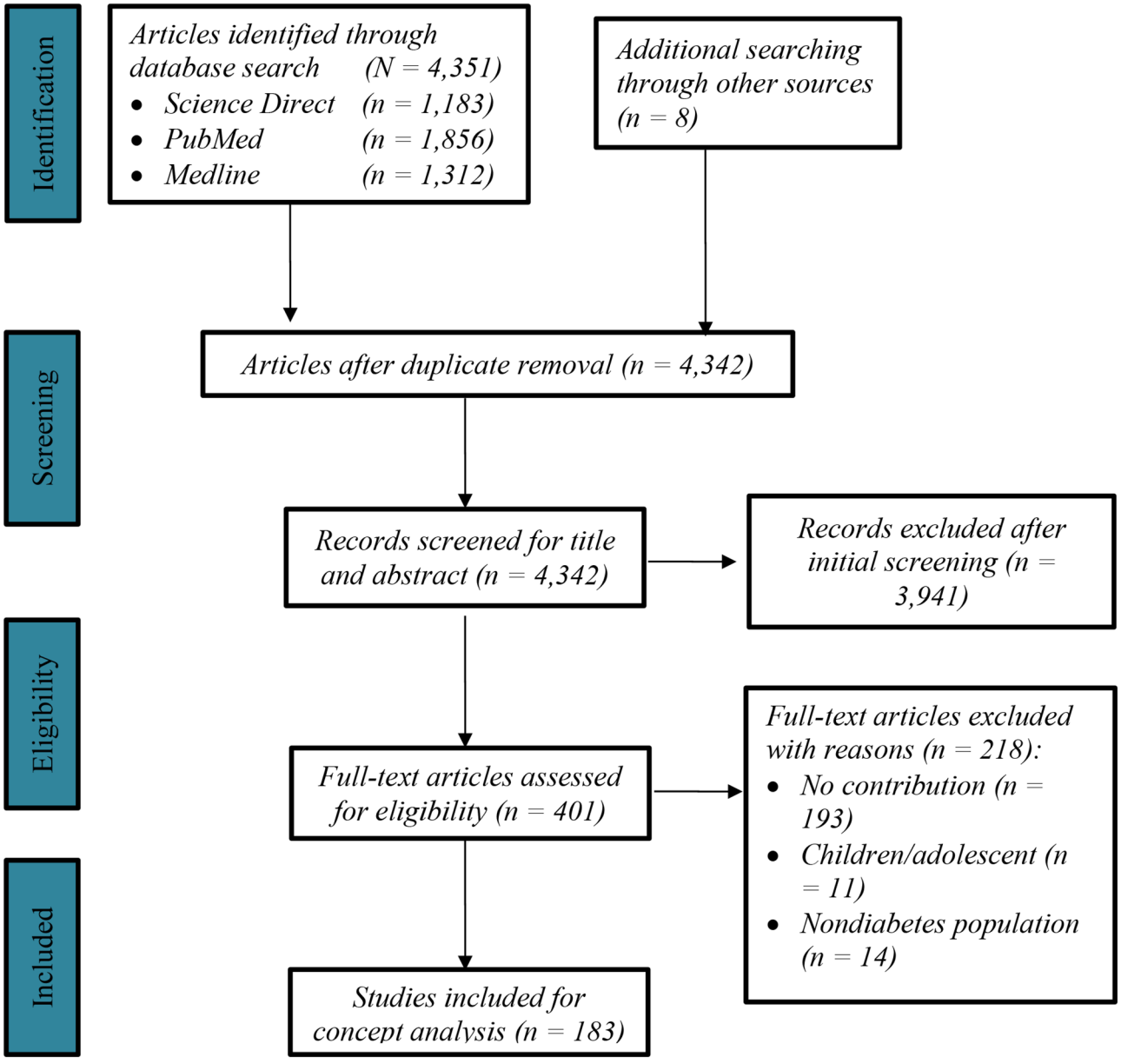

Fig. 1 PRISMA flowchart

perceived satisfaction with that care. Here, satisfaction includes life satisfaction while living with diabetes [23, 24]; family satisfaction, psychological, and spiritual satisfaction [25, 26]; treatment goal satisfaction [27, 28]; and health-care experience [29]. While living with diabetes, patients may feel satisfied or dissatisfied with matters related to diabetes; their satisfaction level ultimately contributes to their perceived DRQoL.

Diabetes can affect a patient's daily activities because they need to cope with the disorder and living with it. Furthermore, diabetes could affect the patients' overall experience of life [21, 26] and may result in specific concerns related to diabetes. These specific concerns include emotional suffering [29, 30], social functioning [26, 31], memory and cognition [31], financial aspects [30, 31], and perceived empowerment [30]. Moreover, problems related to diabetes may be physiological [26, 32], psychological [28, 33], social [28, 29], and treatment-related aspects [26, 34].

Self-management of diabetes refers to all the actions taken by a patient to effectively control diabetes; it may include adherence to a treatment regime [26, 35], following an appropriate diet and eating habits [26, 31], concern about hypoglycemia [36, 37], diabetes control [29, 38], and self-care behavior [26, 27]. Most of the aforementioned actions necessitate behavioral changes, and

Table 2 DRQoL attributes

Initial domains, subdomains, and subscales	Clustering attributes
General health	General health
Life satisfaction	Diabetes-related satisfaction
Family satisfaction	
Treatment goals satisfactions	
Psychological and spiritual satisfaction	
Healthcare experience	
Diabetes impact in life	Diabetes impact
Emotional suffering	
Social functioning	
Memory and cognition	
Financial aspects	
Perceived empowerment	
Problems in the area of physiology	
Problems in the area of psychology	
Problems in the area of social	
Problems in the area of therapy	
Adherence to the treatment regimen	Self-management of diabetes
Diet and eating habits	
Concern about hypoglycemia	
Diabetes control	
Self-care behavior	

they consequently affect the well-being of people living with diabetes.

Constructing DRQoL cases

Model DRQoL case

We first constructed a model case to describe real-life experiences reflecting attributes that define the characteristics of the concept of DRQoL. In this model case, all attributes were the critical components of the concept [15].

Mr. A, a middle-aged adult, is living with type 2 diabetes. He lives happily with his wife and two children and has many good friends. His health is currently optimal, and he is feeling well and has a positive attitude to diabetes treatment. Over the last 2 weeks, Mr. A has been experiencing hypoglycemia, but his HbA1c is under control (< 7%). He independently checks blood glucose three times and records the data in his notebook every day.

In this model case, Mr. A is living well (general health attribute) and is well-received by his family and friends (satisfaction-related diabetes attribute). Although he has been experiencing hypoglycemic events over the last few weeks, his diabetes is well-controlled (diabetes impact attribute). He also performs self-checking of blood glucose regularly (diabetes self-management attribute).

Additional DRQoL case: borderline

We then constructed a borderline case. In the borderline case, there are several attributes reveal in the case [15].

Mrs. K is an older woman living with type 2 diabetes for almost 35 years. She lives alone and does not have any health-related complaints. She refuses to visit the clinic because she is unsatisfied with her diabetes treatment. She has told her nurses that she is irritated because her physician has not allowed her to adjust the insulin dose.

Here, Mrs. K indicates no complaint (general health attribute), but she would like to adjust the insulin dose according to her blood sugar level (diabetes self-management attribute). She refuses to visit the clinic because she is dissatisfied with the diabetes care she has been receiving (diabetes-related nonsatisfaction attribute).

Additional DRQoL case: related

Subsequently, we created a related case. A related case seems similar meaning of the concept but it is absolutely not the concept and different with the core attributes of the concept [15].

Mrs. M has been diagnosed as having gestational diabetes in the second trimester. She is physically active and is doing well with her pregnancy. Because this is her first pregnancy, her husband treats her well, often giving her gifts and surprises. They live together in a small city, and her mother routinely visits Mrs. M.

This is a related DRQoL case because it is similar, but not identical, to the model DRQoL case. Although Mrs. M feels happy, loved, and fully supported and her general health attribute is favorable, she does not show diabetes-related satisfaction, impact, and self-management.

Additional DRQoL case: contrary

We also constructed a contrary case, where none of the critical DRQoL attributes occur [15].

Mr. S, a young adult with type 1 diabetes, lives with his family. He often feels sick and thirsty. Every day after waking up and before sleeping, his mother pricks him for blood glucose monitoring, which make him feel unsatisfied with the care he receives. At school, he feels unaccepted by his peers and is often bullied for his diabetes.

This is a contrary DRQoL case because the young adult exhibits a poor DRQoL—in contrast to the model case. Mr. S feels unwell and expresses dependent diabetes self-management, dissatisfaction, and poor diabetes impact.

Additional DRQoL case: invented

Finally, we constructed an invented case, where we considered an uncommon situation [15].

Mr. H has been diagnosed as having type 2 diabetes only 3 days ago. He was fine with knowing that he had diabetes. Although he has been prescribed oral antidiabetic medications, he wishes to get an insulin

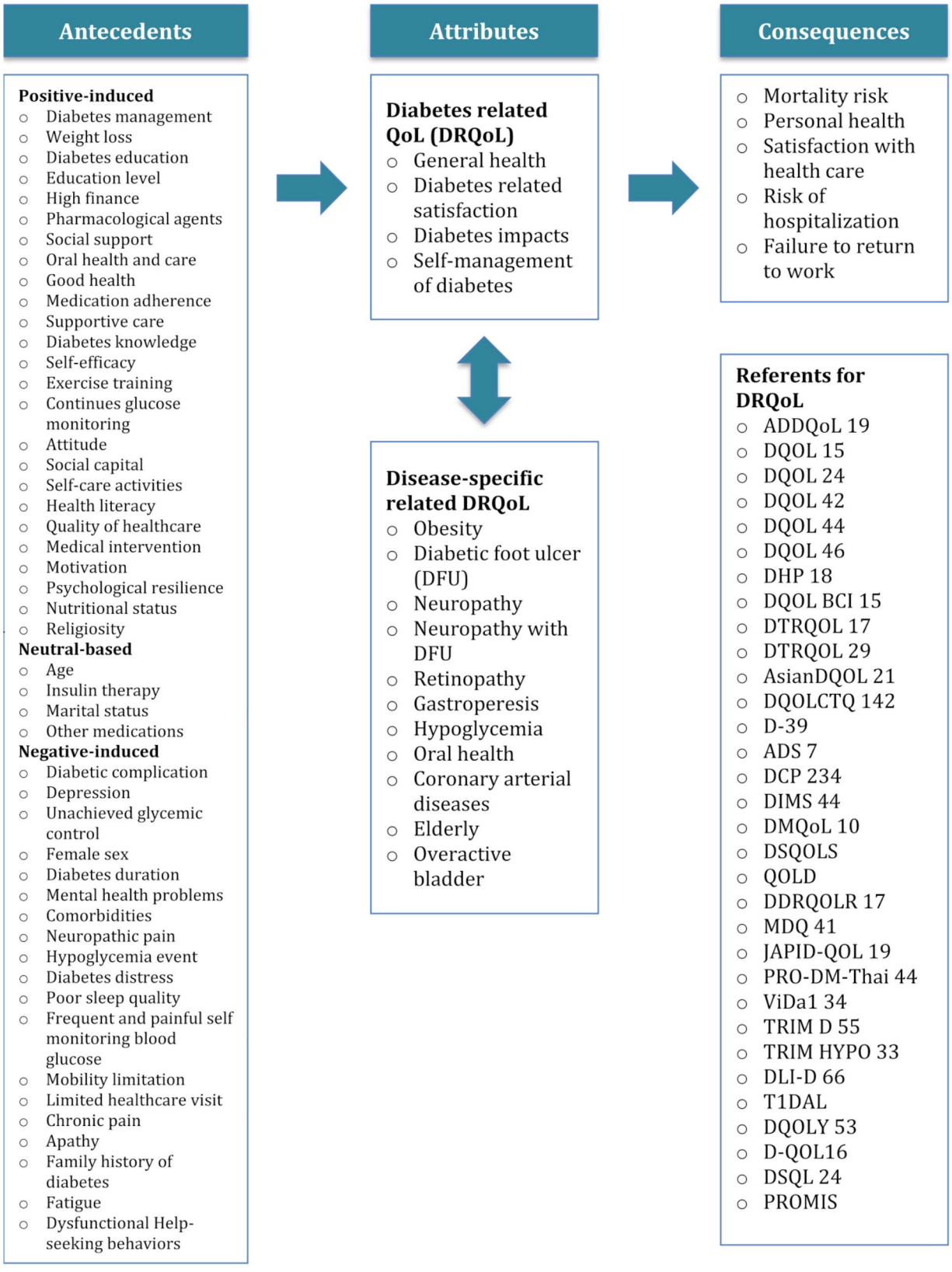

Fig. 2 Model of concept analysis for diabetes-related quality of life

prescription. He told the nurse in charge about how to perform abdominal insulin administration at the first visit. He has not shown any sadness or worry, believing that diabetes is a benign disease and is easy to cure.

This case was invented for the following reasons: As the first oral treatment is standard care for diabetes, no people living with diabetes would request to receive insulin. In addition, at the first visit, most people living with diabetes would not know how to administer insulin. Even if they previously learnt injection administration procedure (which is uncommon), they would not have mastered it.

Identification of DRQoL antecedents

Antecedents are the factors or situations that occur before a concept [15]. In the current study, they were taken from DRQoL predictors, determinants, or risk factors. During the analysis, the identified antecedents varied widely. Thus, we classified the antecedents based on their effect on DRQoL and proposed three antecedents: positive-induced, neutral-based, and negative-induced (Fig. 2 and Supplementary Table 2).

The positive-induced antecedents refer to all factors that can improve or exhibit a positive association with DRQoL. Of 25 positive-induced antecedents, diabetes management, weight loss, diabetes education, education level, and better financial status were the top five factors, and they frequently were mentioned in the included articles (Fig. 2). Diabetes management includes all activities involved in diabetes self-care, such as dietary intake, regular physical activity, stress management, and blood sugar self-monitoring [23, 38]. Weight loss is essential for people living with diabetes, particularly those who have obesity or are overweight, to maintain good DRQoL [39, 40]. Diabetes education refers to activities that empower, enhance, or increase a patient's understanding of diabetes and its care [41, 42]. The higher the education level and financial status of a people living diabetes, the higher is their DRQoL [5, 43]. All these top five factors are positively associated with DRQoL, thereby contributing to the higher DRQoL outcomes. Figure 2 lists all positive-induced antecedents found in this study.

Neutral-based antecedents are related to the debatable factors contributing to DRQoL, conferring a positive or negative effect on DRQoL. In this study, these antecedents included age, marital status, other medications, and insulin therapy—all of which have been indicated to exert equivocal effects in the included studies. Carlson et al. [44] and Lu et al. [45] reported a positive association between age and DRQoL, indicating that higher age is associated with higher DRQoL scores. However, several other studies [46, 47] found a negative correlation between age and DRQoL, with younger age associated with better DQRoL score. Lu et al. [45] indicated that married people living with diabetes have worse DRQoL than do those who are not; however, other studies have described contrasting findings [5, 48]. Taking supplements or multiple medications for diabetes comorbidity may positively [27, 49] or negatively [50] affect DRQoL. Insulin therapy is also related to DRQoL either positively [51, 52] or negatively [53, 54].

Negative-induced antecedents refer to all factors that can decrease DRQoL or which exhibit a negative association with DRQoL. Of 19 negative-induced antecedents, diabetes complications, depression, unachieved glycemic control, female sex, and diabetes duration were the top five factors. Diabetes complications including foot ulcer, neuropathy, retinopathy, and hypoglycemia negatively affect DRQoL [55, 56]. Depression is a major concern for people living with diabetes; it was found to be an independent predictor of reduced QoL [57, 58]. Unachieved glycemic control (HbA1c > 7%) was related to decreased DRQoL [28, 59]. Being female was consistently reported to reduce DRQoL in several articles [5, 21]. Diabetes duration may also be negatively associated with DRQoL: the longer the diabetes duration, the lower is the DRQoL [5, 60]. All these top five factors are negatively asscociated with DRQoL, thus contributing to lower DRQoL outcomes.

Identification of DRQoL consequences

Consequences are factors or events that occur after a concept; they are either positive or negative outcomes [15]. The consequences of DRQoL were defined as all the factors or events predicted by DRQoL. Mortality risk, personal health, satisfaction with health care, hospitalization, and failure to return to work were identified as DRQoL consequences from the literature (Fig. 2 and Supplementary Table 2).

Studies have reported that higher DRQoL is an inverse independent predictor of mortality risk (hazard ratio [HR] = 0.979, 95% confidence interval [CI] = 0.966–0.992) in people living with type 2 diabetes [61, 62]. Mortality risk was estimated to increase by 5–9% with every 1-point decrease in the DRQoL score [63] and by 10–11% with every 10-point decrease in the DRQoL score [64]. Li et al. [65] identified that people living with diabetes with low QoL who are physically inactive (i.e., do not perform any physical activity in their leisure time) have higher mortality risk (HR = 4.49, 95% CI = 2.15–9.36) than those with high QoL who are physically active. The scores for personal health and satisfaction with health care in the previous year improved by 2.1 and 1.3, respectively, for a 10-point increase in the DRQoL score [66, 67]. Secondary analysis in American people living with diabetes demonstrated 2–4% and 7–12% increases in hospitalization risk and failure to return to work, respectively, as a result of every 1-point decrease in the DRQoL score [63]. Additionally, young adults living with diabetes reported

that a 10-unit increase in DRQoL was associated with increases of 1.3 and 2.1 units in satisfaction with health-care services and their personal health, respectively [6].

Definition of empirical referents of DRQoL

Next, we identified 32 measurement tools that specifically quantify DRQoL (Fig. 2 and Supplementary Table 2). The most common DRQoL tools were Audit of Diabetes Dependent Quality of Life (ADDQoL, including 19 items) [21, 68], Diabetes Quality of Life (DQOL, including 46 items) [26, 69], Diabetes Health Profile (DHP, including 18 items) [26, 70], Diabetes Quality of Life Brief Clinical Inventory (DQOL BCI, including 15 items) [27, 71], Diabetes Therapy-Related Quality of Life (DTRQOL, including 29 items) [26, 33], Asian Diabetes Quality of Life (AsianDQOL, including 21 items) [26, 31], and Diabetes Quality of Life Clinical Trial Questionnaire (DQOLCTQ, including 142 items) [26, 36].

We also identified 12 tools for disease-specific DRQoL (Supplementary Table 2), most of which are designed specifically for diabetes-related complications or comorbidities. These included Impact of Weight on Quality of Life-Lite scale (IWQOL) for obesity and overweight (including 31 items) [72], Neuropathy Specific Quality of Life (NeuroQoL) for neuropathy (including 27 items) [57, 61], and Diabetic Foot Ulcer Scale–Short Form (DFS-SF) for foot ulcer (including 29 items) [73]. Moreover, 17 generic tools commonly used to assess QoL in people living with diabetes were identified (Supplementary Table 2). These included Medical Outcomes Survey Short Form (SF) 36 [33, 74], SF12 [6, 29], European Quality of Life 5 Dimesion (EQ-5D) [5, 67], and World Health Organization Quality of Life Brief (WHOQOL Bref) [43].

Discussion

In this study, we determined the broad range of the DRQoL concept and identified 4 attributes, 48 antecedents (25 positive-induces, 4 neutral-based, and 19 negative-induced antecedents), 5 consequences, and 32 referents of DRQoL.

Moreover, general health, diabetes-related satisfaction, diabetes impact, and diabetes self-management were identified as the critical components of DRQoL. Clustering of the identified attributes was performed based on their shared concept to describe DRQoL. For instance, problems in the area of psychology [28, 33] were clustered as diabetes impact. A study identified critical characteristics of QoL to be (a) subjective appraisal of life; (b) subjective satisfaction related to social, psychological, and physical aspects; and (c) objective measures in life [7, 8]. These critical attributes may be reliable with DRQoL attributes such as general health and diabetes-related satisfaction. Because DRQoL is disease-specific QoL, satisfaction includes life satisfaction but also family satisfaction, treatment goal satisfaction, psychological and spiritual satisfaction [25, 26], and previous health-care experiences [29], all of which are related to living with diabetes. Diabetes impact and diabetes self-management are unique factors that differentiate DRQoL from general QoL. Diabetes impact is related to life impact [21, 26], positive impact (e.g., perceived empowerment) [30], and negative impact (e.g., physiological problem) [26, 32]. Self-management of diabetes includes the daily behaviors of people living with the disease, such as diet and eating habits [26, 31], concern about hypoglycemia [36, 37], and self-care behavior [26, 71].

The antecedents of DRQoL vary and affect an individual's QoL. To the best of our knowledge, the current concept analysis provides a comprehensive understanding of the contributing factors related to DRQoL. Because the outcomes of the antecedents are broad, the antecedents can be grouped based on their contribution to DRQoL. Most studies reported consistent positive-induced antecedents of DRQoL—including diabetes management [75, 76], diabetes education [41, 42], and oral health and care [77]—and negative-induced antecedents of DRQoL—including diabetes distress [22, 28], poor sleep quality [57, 78], and unachieved glycemic control [28, 47]. Notably, factors such as age, marital status, insulin therapy, and other medication were considered neutral-induced antecedents because they produced conflicting contribution to DRQoL outcomes, manifesting as either positive or negative effects across the included studies. Additional meta-analyses are warranted to further investigate this inconsistency and determine the contribution of these neutral-induced antecedents to DRQoL. By considering the wide range of DRQoL antecedents, health-care providers may be able to improve DRQoL among people living with diabetes.

Only few studies (3.8% of all included articles) provided information on the consequences of DRQoL, mainly because QoL is considered a distal outcome in research on chronic diseases, including diabetes. In the current analysis, we found the positive and negative consequences of DRQoL. Specifically, the positive consequences are personal health and satisfaction to health care; increasing the DRQoL score can improve individual health status and increase health-care satisfaction [66, 67]. By contrast, hospitalization risk, failure to return to work [63], and mortality risk [63, 64] are the negative consequences of DRQoL. If the DRQoL score decreases, negative consequences increase, and vice versa. Notably, DRQoL affects a patient's hospitalization risk and mortality risk. Dixit et al. [61] and Kleefstra et al. [62] have reported that DRQoL is an independent factor determining mortality risk in people living with diabetes. Thus, health-care providers should consider DRQoL as a main outcome in people living with diabetes.

Our analysis identified a large number of reference tools for assessing DRQoL in people living with diabetes: 32 for DRQoL, 12 for disease-specific DRQoL, and 17 for generic tools for assessing QoL. Almost all of these assessment tools are valid, reliable, and ready for use in both clinical or research settings. The Diabetes Care Profile (DCP) was documented as the tool with the highest number of questions (234 items) [26, 70], followed by the DQOLCTQ with 142 questions [26, 36]. Both the DCP and DQOLCTQ may provide a comprehensive assessment of DRQoL due to the multidimentional aspects covered in their domains or subscales. However, the large number of questions presents drawbacks, such as increased time consumption and a high rejection rate from participants. We noted that the ADDQoL (19 items) was the most commonly used tool for evaluating DRQoL in people living with diabetes [21, 68]. Next, the DQOL (including the DQOL BCI, ranging from 15 to 46 items) was the second most commonly used instrument for DRQoL [26, 27, 69, 71]. Therefore, the ADDQoL and DQOL appear to be wise options for evaluating DRQoL, as supported by our findings on the most commonly used assessment tools. The AsianDQOL is notable for its ethnic specificity and is applicable to Asian people living with diabetes [26, 31]. Finally, Type 1 Diabetes and Life [29] and the ViDa Questionnaire [26] are good examples of DRQoL assessement tools for people living with type 1 diabetes.

An appropriate understanding of the DRQoL concept can aid in improved recognition of the actual care needs of people living with diabetes, and the current definition of DRQoL may inform nurses and other health-care providers of diabetes care and management in people living with the disorder. Both positive- and negative-induced antecedents and the consequences should be considered while providing care to people living with diabetes. Moreover, several available referents can aid in adequately determining or evaluating patient's DRQoL.

Although this study provided a clear definition of DRQoL, it has several strentghs and limitations. The strengths of the analysis included the large numbers of article reviewed, which confirmed the comprehensive conceptual structure of DRQoL among people living with diabetes. Additionally, the analysis identified 48 complex antecendents affecting DRQoL. For the limitations, our concept analysis was conducted only for English full-text articles. Moreover, the results of this study can be generalized to only people living with type 1 or type 2 diabetes because none of the included articles examined people living with gestational diabetes.

Conclusions

The current results aided in differentiating the concept of DRQoL from other broad definitions of general QoL. DRQoL is defined as perception and/or appraisal in regard to the life, satisfaction, and major interest in the context of diabetes care while living with diabetes. We found that DRQoL in adult people living with diabetes includes four attributes; general health, diabetes-related satisfaction, diabetes impact, and diabetes self-management. Approximately 25 positive-induced (i.e. social support), 4 neutral-based (i.e. age), and 19 negative-induced antecedents (i.e. fatigue) were also identified. Finally, DRQoL was found to be related to personal health, satisfaction with health care, hospitalization risk, failure to return to work, and mortality risk. The current available measures of DRQoL in research and clinical settings vary and make the evaluation is possible.

Abbreviations

ADDQoL	Audit of diabetes dependent quality of life
AsianDQOL	Asian diabetes quality of life
DCP	Diabetes care profile
DFS-SF	Diabetic foot ulcer scale–short form
DHP	Diabetes health profile
DQOL	Diabetes quality of life
DQOL BCI	Diabetes quality of life brief clinical inventory
DQOLCTQ	Diabetes quality of life clinical trial questionnaire
DRQoL	Diabetes related quality of life
DTRQOL	Diabetes therapy-related quality of life
EQ5D	European quality of life 5 dimension
HR	Hazard ratio
IWQOL	Impact of weight on quality of life-lite scale
MeSH	Medical subject heading
NeuroQoL	Neuropathy specific quality of life
QoL	Quality of life
SF	Medical outcomes survey short form
WHO	World health organization
WHOQOL Bref	World health organization quality of life brief

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12955-025-02354-2.

Supplementary Material 1

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Author contributions

All authors contributed to the design and performance of study. ALW and NSH did data curation and analysis. ALW wrote the first draft of manuscript. All authors reviewed and agreed to publish the final version of the manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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