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Quality Of Life And Diabetes In India: A Scoping Review

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Abstract
In recent years, numerous studies have explored the quality of life (QoL) in those with diabetes mellitus. The aim of this scoping review was to explore the current state of knowledge on QoL and its various associated factors among people with diabetes in India. Three databases were searched (PubMed, Scopus, and Medline) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. A total of 41 articles were included in the review. The included studies were largely conducted in the Southern states and mainly investigated individuals with type 2 diabetes. The World Health Organization Quality of Life (WHOQOL-BREF) and Short Form Health Survey (SF-36) were the instruments used most often. In general, the studies showed that people with diabetes had poorer QoL than those without diabetes, and women with diabetes reported poorer QoL than men, consistent with findings across the world. However, the studies had significant methodological flaws which limit the validity and generalizability of the findings. Therefore, there is an urgent need to conduct high-quality QoL studies which are representative of all states of India as well as different types of diabetes in India in order to address this gap in the evidence.

Keywords: *Diabetes; health-related quality of life; India; quality of life; scoping review*

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I. INTRODUCTION

Diabetes, a serious long-term condition, is considered one of the great global health challenges of the twenty-first century. An estimated 463 million people had diabetes in 2019, and this is expected to reach 578 million by 2030 and 700 million by 2045.[1] The countries with the highest number of adults with diabetes include China, India, and the USA.[1] Those living with diabetes are predisposed to complications such as retinopathy, neuropathy, cardiovascular disease, and diabetic foot disease. Moreover, psychological complications such as anxiety and depression are also common and impact psychosocial life and everyday functioning, contributing to poor quality of life [QoL].[2] The American Diabetes Association has classified diabetes into the following categories: 1. type 1 diabetes (T1D) "due to autoimmune beta cell destruction leading to absolute insulin deficiency" 2. type 2 diabetes (T2D) "due to progressive loss of beta-cell insulin secretion frequently on the background of insulin resistance" 3. Gestational diabetes mellitus (GDM) as "diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation" and 4. specific types of diabetes due to other causes (example- monogenic diabetes syndromes0).[3] It is important to understand the impact of each of these types of diabetes on QoL in order to achieve the best outcomes for all patients.

Quality of life (QoL)/Health-Related Quality of Life (HRQoL) and diabetes

The World Health Organisation (WHO) has defined QoL as "*an individual's perception 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."*[4] QoL is considered an important health outcome, with good quality of life representing the ultimate therapeutic goal in chronic conditions.[5] The term was first used in medical literature in the 1960s and since then has gained considerable popularity in research and clinical practice. QoL includes four main components namely physical, psychological, social relationship, and environment.[6]

The term, "Health-Related Quality of Life (HRQoL)" is an inclusive term and is defined as the "physical, psychological and social domains of health, seen as distinct areas that are influenced by a person's experiences, beliefs, expectations, and perceptions."[7] In the current literature, QoL and HRQoL are used interchangeably although each has its own meaning. In some definitions, HRQoL reflects health status, whereas in others it goes beyond health and encompasses concepts more consistent with QoL such as the environment.[89] QoL is a broader concept and covers all aspects of life, including education and social environment which reach beyond health. HRQoL, on the other hand, is used to measure self-perceived health or disease status and to understand the distinction between aspects of life related to health.[8]

QoL is decreased in patients with diabetes and becomes even worse when complications develop, or comorbidities exist.[6] Diabetes can negatively affect physical well-being in four major ways: 1) by leading to the development of long-term complications, 2) by being associated with short-term complications, 3) through the demands imposed by various treatment regimens, and 4) by affecting psychological functioning via its impact on mood.[10] For instance, persistent fatigue and tiredness can occur due to elevated blood glucose levels. Conversely, hypoglycemia (low glucose levels) symptoms can also be exhausting and discouraging.[10] Thus, both hypo- and hyperglycemia may affect the patient's overall sense of well-being. Lastly, social wellbeing is also compromised as diabetes can affect the patient's social relationships.[10]

The significant determinants shown to affect QoL among patients with diabetes include the type of diabetes, its duration, glycemic control, gender, complications, treatment regimen, and psychosocial factors.[11]

Quality of life and diabetes in India

India is currently second in the world in diabetes prevalence, with an estimated 77 million people affected in 2019, and this number is expected to reach 101 million by 2030.[1] The Indian Council of Medical Research (ICMR) - India DIABetes (ICMR-INDIAB) study has reported diabetes prevalence in 15 of the 31 states/union territories of India completed and published to date. The average prevalence was 7.3%; however, large differences in prevalence are observed between the states, indicating epidemiological transition.[13]

The earliest studies on diabetes QoL in India were conducted among T1D patients in 2007[14] and among T2D patients in 2009.[15] Since then, QoL assessment publications have increased however they are largely reported from tertiary care hospital settings and characterized by small sample sizes. Hence, the results of the studies cannot be generalized to the larger Indian population.[16] In addition to the existing drawbacks as stated above, more QoL assessment tools are being developed,[171819] increasing the complexity of generalizing from multiple QoL tools. A recent article reported a scarcity of QoL studies among diabetic patients in India as a major limitation of the current literature.[16]

Hence, better recognition of the importance of the QoL construct in managing chronic conditions is important and a review of QoL studies, timely. Therefore, this scoping review aims to explore the current state of knowledge on QoL in people with diabetes in India. This paper also attempts to study the various factors associated with QoL in those with diabetes in India.

Quality of life and type of diabetes

There were 29 studies with QoL assessment in T2D cohorts. Four studies reported QoL assessment among T1D patients. [14273940] A single study reported QoL assessment among mothers with gestational diabetes mellitus.[41] Seven studies have conducted QoL assessment among both T1D and T2D patients with diabetes.[15253236384243]

Only a few studies reported the mean QoL scores among T2D patients, and the scores varied drastically among different QoL assessment tools as seen in Appendix 1. The minimum score of 38.40 was reported from using the SF-36 tool,[31] and the maximum score of 86.83 was reported by QOLID.[44] Four studies reported scores that varied between 54.8 and 57.8.[25333645]

Among the T1D patients, the mean DAWN QoL scores reported were 35[39] and 29.3[40] which indicated a moderate QoL. The higher DAWN scoring indicates a greater impact on QoL.[40]

Quality of life and gender

Of the reviewed studies, only 14 reported gender and QoL. Poorer QoL in women than men were reported in nine studies on T2D[152325313537454647] and in one study on T1D.[14] It is of interest that three studies had reported better QoL among female respondents with diabetes when compared to their male counterparts.[303446]

Poor sleep quality was frequently reported among females as compared to men with T2D, which had detrimental effects on the HRQoL assessment.[48]

Quality of life and duration of diabetes

Of the 41 reviewed studies, seven studies reported a longer duration of diabetes to be associated with poorer QoL among T2D patients.[24262937495051] However, this factor was not reported in the T1D studies.

Quality of life and glycemic control

Not surprisingly, poor glycemic control was associated with impaired QoL in three studies among T2D patients.[303437] Similarly, poor glycemic control was associated with poor QoL among T1D children in one article.[27]

Quality of life and diabetes-related complications

Of the 41 reviewed articles, four studies reported QoL assessment and diabetes-related complications. A cross-sectional study on QoL assessment among 382 T1D and T2D patients with different microvascular and macrovascular complications reported that diabetic complications were associated with reduced QoL. Neuropathy and nephropathy were associated with lower QoL as compared with other diabetic complications.[38]

A case-control study (100 cases and 100 controls) among T2D patients from Delhi reported lower mean values of WHO-QoL for all the domains in patients with complications of diabetes (more specific for nephropathy and neuropathy) as compared with patients without diabetes complications.[26]

Among the microvascular complications of diabetes, diabetic retinopathy (DR) and QoL assessment were reported in three studies.[425253] One study reported lower QoL among patients with diabetes with diabetic retinopathy (DR) as compared to those without. The study participants included T1D and T2D patients. The lowest QOL scores were obtained from subjects with proliferative diabetic retinopathy (PDR).[52] The second was a cross-sectional study that reported poor QoL with proliferative diabetic retinopathy (PDR) as compared with nonproliferative DR (NPDR) in 250 T2D patients.[42] The third, a prospective, observational study among 189 T2D patients reported a significant reduction in HRQoL with the severity of retinopathy.[53]

Quality of life and treatment regimen

Better QoL was observed among patients receiving a single- or two-drug regimen as compared with patients receiving a combination regimen of oral hypoglycemic agents (metformin, glipizide, voglibose, repaglinide, sitagliptin, and vildaglitpin) and insulin in one study with T2D patients.[54] Treatment satisfaction of patients receiving metformin alone or in combination with glipizide was better than that of the patients receiving oral hypoglycemic agents and/or insulin.[54]

Quality of life and psychosocial factors

A study from Jaipur (n = 50) reported that more than half of patients with T2D noted impaired QoL.[37] In another cross-sectional study, among 300 T2D participants from Delhi, poor sleep quality was reported and associated with poor QoL.[48]

A case-control study showed that depression was significantly more prevalent among people with T2D than controls and was associated with poorer QoL.[26]

A study among T2D patients with and without depression reported that in the presence of depression, QOL deteriorated.[55]

Quality of life and comorbidities/metabolic syndrome

Of the 41 reviewed studies, only two assessed QoL among T2D patients with comorbidities[24] or metabolic syndrome.[56] A stroke had a high negative impact on the physical HRQoL. The presence of comorbidities affected the physical component summary (PCS) and the mental component summary (MCS) of the Short Form Health Survey-12. Subjects with visual impairment and stroke had significantly reduced quality of life.[24] Among T2D diabetes patients with metabolic syndrome, a greater significant decline is observed in PCS and MCS as compared to those without metabolic syndrome.[56]

II. DISCUSSION

The present review is the first to our knowledge to collate articles related to QoL assessment in people living with diabetes in India. The review demonstrates that most evidence on QoL in India is available in individuals with T2D patients. The QoL assessment among T1D Indian children is scarce and needs to be investigated in future studies. In addition, there is little to no evidence of QoL in the Indian population for gestational diabetes mellitus (GDM) and monogenic forms of diabetes. As five million women have GDM in India[62] and new cases of monogenic diabetes are continually being reported due to advances in the field of molecular genetics,[636465] QoL assessment needs to be urgently addressed in these subtypes of diabetes in order to be able to offer more support to these groups.

The largest number of studies (19 studies) were reported from southern states of India, many from teaching tertiary hospitals/institutions, especially from Karnataka as compared to other regions (North, East, West) of the country. One of the possible reasons could be that Karnataka has the largest number of teaching medical institutions in India. Notably, only a single study was reported from community settings. In the future, QoL assessment needs to be undertaken in large community settings with a proper sample size selection to understand the QoL status at the population level, which is currently missing. The presently available studies have small sample sizes, come from hospital settings, and have a short duration which makes it difficult to generalize the findings for a larger population.

During this review, it was observed that QoL is largely reported as being better among men as compared with women with diabetes, a consistent finding with studies conducted across the world.[1166] A study was done

in a secondary care setting highlighted the need to improve the QoL among women with diabetes.[25] Rubin *et al*.[11] in their review paper stated that men with diabetes have an advantage over women in HRQoL and recommended control for gender in future studies, which would be relevant to the Indian settings as well

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