Original Article

Health-related quality of life and associated factors among patients with diabetes mellitus in Botswana

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ARTICLE INFO

ABSTRACT

Background: Health-related quality of life (HRQOL) is an important aspect of diabetes mellitus care. The objective of the study was to determine the HRQOL of diabetes mellitus (DM) patients in Botswana as little known in Africa. *Materials and methods*: A cross-sectional study of 380 randomly selected DM patients in a tertiary clinic in Gaborone, Botswana was conducted to obtain Data on HRQOL and structured questionnaire was used to collect information on sociodemographic and clinical characteristics. Multivariate logistic regression to determine sociodemographic and clinical characteristics associated. *Results*: Majority of patients were female with no formal education or primary level of education. Mean HbA1c was 7.97% (SD: 2.02) and most patients had poor glycemic control. The majority had both worse physical composite score (PCS-12) and mental composite score (MCS-12), with worse proportions of the two. Female gender, older age ≥65 years, and the presence of three or more documented diabetic complications were associated with significant worse PCS-12. Presence of two diabetic complications, three or more diabetic complications, and musculoskeletal disease were associated with significant MCS-12. *Conclusions:* Diabetic patients in Botswana have relatively poor HRQOL. The fact that most patients present late with complications calls for policy attention to diagnose diabetes mellitus early and prevent associated complications, ultimately improving health-related quality of life among diabetes mellitus patients.

1. Introduction

Diabetes mellitus (DM) is a disease of global public health importance associated with high morbidity and mortality.[1,2]

According to International Diabetes Federation report of 2015, about 415 million people have DM globally with the figure projected to have increased to 642 million by 2040 or maybe even doubled by the year 2040.[3,4] The greatest increase will be in developing countries (69%) compared with developed countries (20%),[5] with non-communicable disease (NCDs) accounting for up to 80% of deaths among developing countries.[6] In Botswana, the prevalence of DM among adults (20–79 years) is approximately 52 per 1000 people out of which 31.6 per 1000 remain undiagnosed.[3]

Health-related quality of life (HRQOL) refers to the physical, psychological and social aspects of health that are influenced by person's experience on beliefs, expectations and perceptions. Understanding these domains by health care workers has an

advantage in terms of incorporating chronic disease management strategies into routine care, leading to a reduction of both morbidity and mortality, including patients in developing countries.[7–12] The psychosocial burden of living with diabetes mellitus is considerable as it affects self-care behaviors, leading to long term poor glycemic control, increased risk of long-term complications and poor quality of life.[9,13–15] Understanding the measurements of HRQOL as well as the factors associated with poor quality of life has a benefit in terms of improving the physical and psychosocial burden associated with DM, ultimately reducing associated costs, morbidity and mortality.[15,16]

Published studies have found that DM patients without complications have higher overall utility values than those with complications.[17] Currently, most of the published literature on HRQOL of patients with DM is based on developed countries with little known among developing countries. Whilst it is well acknowledged that there is better access to health in developed countries compared to developing countries, there are more associated morbidities of DM in developing countries,[9] which will have a considerable impact on their HRQOL.[12,18] Consequently, we sought to determine the HRQOL, and associated sociodemographic and clinical variables, among patients with DM in Botswana. The findings will be used to suggest future strategies in Botswana to improve the management of these patients if pertinent. The findings may also be of interest to other African countries with increasing rates of NCDs including diabetes.

2. Methods

2.1. Study area, design and participants recruitment

Details of study area, design and participants recruitment, inclusion and exclusion criteria and how sociodemographic and clinical data was collected have been described in details elsewhere,[19] In summary, a cross-sectional study was conducted whereby 380 patients were randomly selected for the purpose of this study between July to September 2015 in Block 6 clinic, a tertiary unit in Gaborone, Botswana, and data was obtained by means of standard structured questionnaire interviews, Further data was obtained from patients' hospital charts. This clinic was chosen as it offers services to over 3000 diabetic patients. In Botswana, medicines are provided free-of-charge to patients; consequently, co-payment for medicines is not an issue.[19] On average 1800 to 2000 diabetic patients visit the clinic monthly.

2.2. Sample size

The sample size was calculated from the formula of descriptive cross-sectional study, i.e. $N = Z^2 \, p \, (100 - p)/d^2$; where: N = estimated minimum sample size, Z = Standard deviation of 1.96 at 95% confidence interval, p = Response rate to the SF-12 quality of life questionnaire in the outpatient clinic[20] which was 44.3%, and d = the margin of error on p, which is approximately 0.05. Consequently, $N = 1.96 \times 1.96 \times 44.3 \times 55.7/25$, = 379.

As seen, the estimated minimum sample size was 379 patients.

2.3. Study instrument

The most widely used generic measure of quality of life in studies of people with diabetes mellitus is the Medical Outcomes Study (MOS) Short-Form General Health Survey, which has several forms (SF-36, SF-20, and SF-12). The MOS instrument includes physical, social and role functioning scales to capture behavioral dysfunc-tion, and this instrument has been shown to reflect more subjectively components of health and well-being.[21]

We chose to use Social factor (SF-12) as a tool to measure health related quality of life because it has been shown to be as effective as SF-36. The tool (SF-12), is brief and convenient to use.[22–27] Whilst we did not find studies using SF-12 scores among patients with diabetes mellitus in Botswana, SF-12 has been used several times to assess HRQOL among patients with chronic diseases in the Republic of South Africa.[28–30] Consequently, in view of the proximity of two countries and both have public healthcare systems, we saw it as justifiable to select this tool for our study. Both countries also have a high prevalence of Human Immunodeficiency Virus (HIV). In Botswana, over 22% of the adult population have HIV, with higher rates especially among women.[31] Consequently, considerable opportunity for co-morbidity of diabetes among these patients.

Specifically, we used the short form of the widely used SF-36 called SF-12v2™ Health Survey (SF-12; Quality Metric Inc., Lincoln, RI, USA). The SF-12v2™ is a brief and reliable measure of overall health status.[32] It measures eight domains of health; physical functioning, role limitations because of physical health (role-physical), bodily pain, general health perceptions, vitality, social functioning, role limitations because of emotional problems (role-emotional) and mental health.[32] The information is then scored by the scale from 0 to 100 on each of the domains, as well as for the Physical Component Summary (PCS-12) scale and Mental Component Summary (MCS-12).[33] We entered the responses of SF-12 for each patient into the SF website (www.sf-36.org/SF-12.html). The website computes the scores of PCS-12 and MCS-12 into the range 0–100, whereby 0 indicates the lowest composite score and 100 the highest composite score. The outcome variables in our study were; the worse physical composite score and worse mental composite score.

We did not conduct separate analysis for Type 1 or Type 2 diabetes, similar to other studies,[12] as the vast majority of patients in Botswana attending clinics such as this one are Type 2. The majority of Type 1 patients in Botswana continue to attend pediatric and adolescent clinics at the National hospital. Consequently, it was perceived that undertaking a separate analysis for the two types of diabetes would be difficult to interpret; consequently, we combined these two types of diabetes mellitus for the study. However, we did assess the two types of diabetes as an independent variable.

2.4. Dependent variables

We measured both the worse PCS-12 and worse MCS-12 as a score of <50%, and the better PCS and MCS as the scores of ≥50%. Our outcome (dependent) variables were worse PCS-12 and worse MCS-12.

The choice of 50% cut off is based on the fact that the scores that are summarized above or equal to 50% are categorized as better health status and those below 50% are categorized to have a worse health status.[34–37]

2.5. Independent variables

Our independent sociodemographic variables were; age, gender, marital status and level of education. We also measured weight and height to determine the Body Mass Index (BMI). Glycemic control was determined by extracting results of within past three months of HbA1c from Integrated Patients Management System (IPMS) and defined as good (<7%) and poor (≥7%).

We also calculated the average blood pressure in the last 3 visits, and documented the HIV status as recorded either in the