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Disease specific knowledge, attitude and practice, quality of life and health status of diabetic patients in urban Malawi

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NCDs are well documented as causing significant mortality and morbidity. DM is considered a serious NCD with an increasing global prevalence. Poverty and infectious diseases have focused most healthcare attention in sub-Saharan Africa over the last decades. However, obesity and DM have become a priority due to population growth and rapid life-style transformation. There is an urgent need for qualified epidemiological data collection and research to support the planning and implementation of DM prevention and treatment programs.

Malawi is one of the poorest countries in the world and its DM prevalence exceeds the world's average (5.26% vs. 8.3%), but little is known about the demographic characteristics and health status of patients with diabetes. The present study is the first investigation that systematically quantified the degree to which type 1 and type 2 DM and treatment, complications, and comorbidities affect the patients' quality of life (QoL). Therefore, this study was carried out at a tertiary referral hospital in urban Lilongwe, Malawi to fill this knowledge gap. This study was performed at the Kamuzu Central Hospital, department of internal medicine, outpatient department, and diabetes clinic. All patients diagnosed with DM and/or receiving treatment in the DC were eligible to participate.

A total of 271 patients were enrolled and recruited and 30% were males and 70% females. It was remarkable that middle-class and obese females living in the capital were overrepresented and were a large portion of the patients attending the DC. The clinic was not determined by the medical needs of the society, but rather by the patients' social class. Middle-aged people with DM represented the majority of patients attending the DC. More than half (52%) of the participants had a good level of education.

Arterial hypertension was the most frequent comorbidity (61%) found. It was higher than that found in the Blantyre study (52%). Approximately half (54%) of patients with arterial hypertension took ACEI, which can protect against the development of diabetic complications. More than half of the hypertensive participants received thiazide. Prescriptions of beta-blockers were lower (10%) for patients in this study compared to a previous study in Malawi (17%) (Cohen et al. 2010). Only 4% of the study participants had a history of cerebral stroke. Angina pectoris was only diagnosed in 3% and myocardial infarct in only 1.4%. Males (65%) frequently complained of ED. It is remarkable that only one male patient was a current smoker and no patient reported current alcohol consumption.

The most frequently prescribed medication were anti-dyslipidaemia drugs (mostly statin) in 56% of the patients. This represented the highest prescription rate found among patients with type 2 DM compared to other six sub-Saharan African countries (11.7%). There was a significant reduction of LDL among patients taking dyslipidaemia drugs. However, these drugs failed to significantly reduce the patients' TG and cholesterol, while HDL was normal in patients with or without dyslipidaemia

drugs. Females had significantly higher LDL levels than males in this study. This might be because obesity is common among females and is almost always associated with a higher LDL as part of the metabolic syndrome. The prevalence of suspected patients with TB was higher (4%) than 2012 WHO-reported cases (22/1000 [2%]) in the general population of Malawi. The HIV/AIDS prevalence was similar to the finding of a previous study in Malawi (13.6% vs. 14%). It is remarkable that prevalence of patients on ARV therapy was higher compared to the smaller number in the Blantyre study in 2010 (92% vs. 16%).

Most of the participants (98%) attended the clinic to refill their anti-diabetic drugs. Apparently, the DC played a limited role for medical consultation and physical examinations, DM education or as a referral centre. Patients saw the facility as a clinic for medication collection. Half of the participants had been diagnosed with diabetes in the last ten years. Furthermore, more than a third (39%) of respondents had at least one member of their immediate family diagnosed with diabetes. There were 77% patients diagnosed with type 2 DM. Six patients were diagnosed with type 1 DM and taking OAD. Apparently, these patients on OAD did not have type 1 DM, but rather type 2 DM. Misdiagnosis and/or wrong documentation was highly possible. It is remarkable that the majority (92%) of patients with type 2 DM taking OAD showed well-controlled average test of HbA1c (7.1%). Patients with both types of diabetes had a non-significant difference in the prevalence of neuropathy and retinopathy. Patients with type 2 DM had a higher prevalence of hypercholesterolemia, hypertriglyceridemia, high LDL and low HDL than those with type 1 DM. Overweight was more prevalent in both sexes than in the general population. There were no underweight patients recorded. The average BP measurement was high in this study because more than 60% of the patients were already diagnosed with arterial hypertension and their hypertension did not appear to be optimally controlled.

The acceptable average HbA1c (7.1%) test might reflect an improvement of the glycaemic control compared to the 2010 study in Blantyre where the HbA1c was 9.4% and compared to those in a previous study in six sub-Saharan African countries where the percentage of patients with an HbA1c > 8.5% was 43.6%, while in this study it was 27.1%. Patients with type 1 DM were significantly more poorly controlled compared to those with type 2 DM (average HbA1c: 7.9% vs. 6.9%). The reason might be a shortage of insulin therapy. The cold chain storage conditions required for optimal insulin effect might be inadequate, which could have been caused by the unaffordability of a refrigerator or the frequent cuts in electricity. The majority of participants in this study had high FBS results (64%). However, the median level of FBS results was lower than those found in a previous study in Blantyre (166 mg/dl vs. 182.7 mg/dl). This might be due to the implementation of metformin as a first-line drug of choice for the treatment of type 2 DM after the study of Blantyre was conducted.

Only 20% of the participants were diagnosed with diabetic retinopathy. The stages were advanced and were not associated with gender, age, type of diabetes, a longer duration of diabetes, presence of arterial hypertension or adequacy of diabetes control (FBS, HbA1c). In contrast to Cohen's study (Cohen et al. 2010), diabetic retinopathy was associated with a longer duration of diabetes in this study. Three quarters of the patients with retinopathy were referred for an immediate panretinal photocoagulation therapy (laser treatment). Males had a significantly higher prevalence of neuropathy

and retinopathy. Patients with lower limb amputations were expected to be enrolled, but there was no one with this complication. Surprisingly, PNP prevalence was half the rate that had been found in a previous study in sub-Saharan African countries (24% vs. 48.41%). Proteinuria was detected in more than half of the patients (56.4%). It was a poor prognostic surprise that a quarter of the patients (23%) were classified as having Stage 3 kidney disease. However, a single test to confirm a diagnosis of CKD could not be relied upon.

This study was the first to assess DM specific knowledge, attitude and practice in patients with diabetes in Malawi. There was a wide knowledge gap about the causes of diabetes. At the same time, there was good knowledge about diabetic symptoms and non-prioritised knowledge about diabetic complications. There were no significant differences in knowledge levels based on HbA1c, gender or type of diabetes. A large number (62%) of patients did not know the type of their diagnosed diabetes. Significantly, more patients with type 1 DM knew the name of their disease compared to patients with type 2 DM. The very limited knowledge about HbA1c testing was expected due to unavailability of HbA1c test in the facility.

It was an encouraging information that more than half of the participants (62%) believed that weight loss is helpful in diabetes management. An increased number of patients had recently tried traditional medicine compared to those who had done so in the last 12 months (20% vs. 4%). It was surprising to record that the majority (three quarters) of patients with diabetes had a fair overall subjective QoL. This study further supported the results found by older studies (in Nigeria and Norway) that patients living with DM have a relatively good QoL. QoL among patients with DM did not differ significantly according to gender, occupation and education level, type of diabetes, management or family history. Patients with DM who were diagnosed with arterial hypertension reported a significantly reduced subjective overall QoL. Probably, these patients knew that both their diseases could not be cured.