

Abstract

Diabetes mellitus is becoming a serious public health issue in Sri Lanka. Patients with diabetes mellitus (DM) need long term comprehensive care in order to minimize complications and improve their quality of life. Quality of care for DM and cost implications have not been quantified at outpatient clinic setting in Sri Lanka.

The objectives of the study were; to develop and validate instruments to measure the quality of services and facilities for DM in the state clinic setting and to assess the quality of services and facilities provided, to assess quality of life (QOL) and household costs for DM, among patients with DM attending outpatient clinics at primary, secondary and tertiary level state hospitals of the Western Province and to estimate the costs of the health system when providing diabetic clinics (DC) at these hospitals.

The study has four phases. In phase I, 'Care for DM Quality of services' (CD QS) instrument with 7 subscales: routine services, monitoring of glycaemic control, modifiable risk control, annual screening, patient empowerment, recording of information and functional aspects, was developed and validated to assess the quality of services provided for patients with DM in the state clinic setting. Validation of CD QS was performed in a sample of 100 patients. Construct validity was established by multi-trait scaling analysis and known group comparisons. 'Care for DM Quality of facilities' (CD QF) instrument had 10 subscales: building, cleanliness and laundry, latrines, basic equipment and furniture, stationery and supplementary items, facilities for health education, laboratory services, supply of medicines, availability of human resources and facilities for smooth functioning of clinic process and community links. Validity of CD QF was established by the consensus of experts.

Phase II assessed the quality of facilities and services for follow up care of DM using Lot Quality Assurance Sampling technique (LQAS). The quality of facilities was assessed in all 10 DC and 13 medical clinics (MC) in all 3 levels of hospitals of the Western Province. A total of 300 patients were included for quality of service assessment; 25 each from 2 DC and 2 MC each at primary, secondary and tertiary level hospitals. Validated study instruments were used with record sheets and an interviewer administered questionnaire (IAQ) collected socio-demographic information. Blood HbA1C and Blood Pressure (BP) were assessed.

Phase III assessed the QOL among 300 followed up patients with DM [150 each from all DC (n=10) and 15 MC in all 3 levels of hospitals] using the locally validated WHOQOL-BREF. An IAQ collected data on socio-demographic and disease related factors.

Phase IV assessed the household cost (Direct: cost of treatment, travel and food for patient and accompanying person, Indirect: lost income due to clinic visit) among the 300 patients enrolled under phase II. To estimate system cost per patient per clinic visit, the scenario based costing exercise was carried out in 6 DC (2 each at primary, secondary and tertiary levels). System cost included current value of building, equipment and furniture with linear depreciation, utilization data and staff mid-point of salaries. Cost of drugs and investigations were excluded as it varied among patients.

Quality of facilities assessment found that privacy during consultation was not provided in 65.2% (n=15) of clinics. Quality of facilities for disabled persons was provided with standard in only 8.7% (n=2) of clinics. Regarding toilets, cleanliness was meeting the standard only in 43% (n=2), 20% (n=2) and 33% (n=3) of clinics in primary, secondary and tertiary level hospitals respectively and regular inspection was highest at primary level (42.9%; n=2). Laboratory services were poor and functioning laboratories were not available in 83.3% (n=6) of hospitals in primary level. Blood HbA1C and urine microalbumin assessment were not available even at tertiary level. Quality of facilities for HE was poor in 42.9% (n=3), 50% (n=5) and 33.3% (n=2) of clinics respectively at primary, secondary and tertiary levels. Supply of medicines was meeting the standard in 42.9% (n=3), 10% (n=1) and 100% (n=6) in primary, secondary and tertiary levels respectively. However, all essential drugs were issued only at 30% (n=3) and 33.3% (n=2) of clinics in secondary and tertiary level and none at primary level. The quality of facilities for basic equipment and furniture was meeting the standard in 60 - 70% of clinics in secondary and tertiary levels compared to the primary level (42.9%; n=3). Furthermore an ophthalmoscope, a stadiometer, a glucometer, a light source and a 10 g monofilament or tooth prick for feet examination were not available in 21.7%, 43.5%, 60.9%, 73.9% and 87% of clinics. Availability of human resources was meeting the standard in all clinics (100%) at secondary and tertiary levels compared to primary level (85.7%). However, Health Education Nursing Officer (HENO) or Diabetes Education Nursing Officer (DENO) was not available in 40% of DC and 46% of MC even at tertiary level MC (33.3%). In service training on DM was not provided for 91.3% of

MO s and 78.3% of NO s. A training plan was not available in 91.3% of clinics. None of the clinics had a patient recall system. Clinical audits and client satisfaction surveys were not carried out in 95.7% and 23% of the clinics respectively.

The mean age of patients with DM was 60.9 years (SD \pm 8.72). Male female ratio was 1: 1.4. Among patients 44% (n=132) had attended the same clinic for 5 or more years. Standard quality of services for routine care complying with the LQAS decision rule was provided in all MC and 5 out of 6 DC. Quality of services for glycaemic control was substandard in all the clinics and target blood glucose was achieved only by 34.3%. Mean HbA1C of the patients was 7.92% (SD \pm 1.7) with the median of 7.5% (IQR 6.7, 8.97). Patients attending tertiary level hospitals had the highest median HbA1C (7.8%; IQR 6.9, 9.2) compared to primary level (7.1%; IQR 6.5, 7.8) ($X^2 = 8.16$, $df = 2$, $p < 0.05$). HbA1C level did not vary according to the type of clinic (U=10941.5, Z=-0.41, $p > 0.05$). Target BP of $\leq 130 / 80$ mmHg was achieved by 63.3% of patients. All the clinics provided standard quality of services for BP control complying with the LQAS decision rule. Annual lipid profile and Body Mass Index were performed meeting the standards in 39% and 19.7% of patients respectively. Quality of services for lipid management was substandard in 4 clinics (33.3%) and none of the clinics provided standard quality services for weight monitoring and modifiable risk factor control.

Annual screening for peripheral arterial disease (10.3%), retinopathy (15%), proteinuria (11.9%) and feet examination (12.3%) were very low in addition to annual performance of ECG (34.3%) and serum creatinine (28.3%). Higher performance of examinations and investigations were observed in DC and at tertiary level. All the clinics were substandard except one DC at tertiary level for quality of services for annual screening and patient empowerment. Only 29.7% (n=89) of patients received group or individual HE at current visit. Information on foot care (72%), dietary assessment (86%), access to a dietician or trained Nursing Officer (60.3%), advice on food intake (50.7%), physical activity (91%) and intake of medicines (46%) were not provided. Recording of basic information was substandard in 9 (75%) clinics and recording of occupation, co-morbidities, risk factors and physical activity were not observed in 93.3%, 33.3%, 60.7% and 92% of clinic records respectively. Quality of services for functional aspects was standard in all the clinics complying with the LQAS decision rule.

QOL of patients with DM was found to be significantly poor ($p < 0.001$) in physical, psychological, environmental health and social relationships compared to the healthy people. Significantly higher QOL assessed by WHOQOL-BREF was observed in younger (< 60 years), married, with higher education (passed O/L and higher) and higher household income (\geq Rs.20, 000/=) ($p < 0.5$). With regard to disease related factors longer duration of DM (≥ 5 years), high FBS (> 110 mg/dl), insulin treatment and presence of complications significantly ($p < 0.05$) lowered QOL of the patients with DM.

The mean total household cost per clinic visit was Rs. 461.80 (SD \pm 559.56) while median cost was Rs. 300/= (IQR 150, 503.75). Direct cost was 92.4% of the total cost. Highest direct household cost was for medicines (46.9%) followed by investigations (31.9%). Patients attending tertiary level incurred statistically significantly higher ($p < 0.05$) cost for travelling. Patients attending secondary level incurred the highest total median cost (Rs. 390.00; IQR 220.50, 755.00; $p < 0.001$). Unit system cost excluding drugs and investigations ranged from Rs. 187.75-339.70, Rs. 67.02-108.79, Rs. 57.08-102.57 at tertiary, secondary and primary levels respectively. Staffing is a major component of unit costs.

The development of instruments provides an opportunity for ongoing assessment and improving quality of care for patients with DM. Infrastructure facilities, HE facilities, laboratory services, medicines and equipment lacking in most DC and MC should be improved. Glycaemic control measured by HbA1C was poor in all three levels of hospitals. Annual screening for complications was very poor in all levels of hospitals except at a DC at tertiary level. QOL was poor among the patients with DM. Direct costs are a significant share of patient costs and costs for medicines and investigations are a major share of direct costs. Essential medicines and investigations for follow up care for DM should be available in state settings. Costs borne by each clinic differ even at the same level of hospital. These findings should be used by health authorities and service providers to improve the quality of care for patients with DM attending state DC and MC.

Key words: Diabetes Mellitus, Quality, Diabetic Clinic, Medical Clinic, Quality of Life, Health care cost, Household cost