ABSTRACT

Background: Sri Lanka has the highest prevalence of diabetes mellitus in the WHO Southeast Asia region. Diabetes mellitus is the second leading cause of Disability Adjusted Life Years in the country and pose a significant burden to the healthcare system and the economy of the country. The social, economic and psychological burden on patients is immense.

Objectives: To assess universal health coverage for people aged 40-69 years with diabetes mellitus type 2 in the Gampaha district focusing on unmet needs, service coverage, equality of service coverage, household economic burden and equality of household economic burden

Methods: A mixed method approach was used. A qualitative inquiry was undertaken to explore the unmet needs associated with healthcare seeking, self-management of diabetes and financing healthcare services among patients with diabetes mellitus by conducting Focus Group Discussions with individuals with diabetes mellitus type 2 and Key Informant Interviews with diabetes care providers.

A descriptive cross-sectional study sampled 479 individuals with diabetes mellitus aged 40-69 years from the Gampaha district using a multi-stage cluster sampling method. An interviewer administered questionnaire was used to obtain data on service coverage for diabetes mellitus, based primarily on American Diabetes Association standards of medical care in diabetes, among individuals already diagnosed with the illness. A similar instrument collected data from the newly diagnosed patients with diabetes mellitus. Both instruments were administered by trained pre-intern medical officers who also obtained physical measurements of study participants assisted by health promotion graduates. Bio-chemical assays were carried out by an accredited private laboratory to assess the achievement of glycaemic, lipid and renal function targets in patients with a history of the illness. The household economic burden due to diabetes mellitus was assessed using a questionnaire administered by trained pharmacy graduates to participants already diagnosed with the illness at the time of recruitment.

The service coverage and effective service coverage were described with descriptive statistics with differences of coverage between government and private sector tested using the Chi square test. The equality of service coverage, effective service coverage

and household economic burden was assessed using absolute inequality and relative inequality measures across equity stratifiers of sex, age, area of residence, highest education level, employment status and household income.

Results: The unmet needs of diabetes patients were most pronounced in relation to the awareness of the causation and complications of diabetes and side effects of antihyperglycaemic medication. Barriers to uptake of lifestyle modification guidance such as busy lifestyle, competing priorities and breaking away from dietary habits were highlighted. Healthcare providers' perspective shed light on supply side barriers such as lack of consultation time, material and human resources in the government sector and lack of adherence to clinical practice guidelines overall.

Of 2,106 participants who consented to participate in the study, 1,767 participated giving a response rate of 83.9%. At the time of recruitment, 404 participants already had type 2 diabetes mellitus and 401 of them were included giving a response rate of 99.2%. The majority were female (57.9%) and 44.9% were aged 60-69 years. The majority of respondents had a regular provider for care of diabetes mellitus (n=362, 90.3%). Most of them chose government sector healthcare institutions for regular care of diabetes (n=192, 53.0%).

The prevalence of unmet needs for physician care for diabetes was 16% (n = 64, 95% CI: 12.5%-19.9%) mostly due to lack of time to make the clinic visit (n = 31, 48.4%). Unmet needs for anti-hyperglycaemic medicines or insulin were reported by only 16 respondents (4.2%, 95% CI: 2.4%-6.6%). Unmet needs for investigations were reported by only 24 respondents (6.0%, 95% CI: 3.9%-8.8%).

The service coverage for diabetes mellitus was assessed based on nine key interventions under the six domains of care, namely; patient-centred collaborative care, lifestyle management, glycaemic control, cardiovascular disease and risk management, microvascular complications and foot care, and diabetes self-management education using the minimal coverage criteria appropriate for each intervention. The lowest coverage of 32.9% (n = 126) was reported for screening for neuropathy and foot care which was assessed using the criteria of 'advice received on foot care and feet inspected at least once and/or examined for sensory loss within the past 12 months.' The highest coverage of 97.1% (n = 372) was reported for blood pressure control assessed on the criteria of 'blood pressure measured at least once during the past 12 months.' Only four

out of the nine selected interventions had a coverage exceeding 50%, namely, collaborative care (n=319, 83.3%, 95% CI: 79.3% – 86.8%), glycaemic control (n = 351, 91.6%, 95% CI: 88.4% – 94.2%), blood pressure control (n = 372, 97.1%, 95% CI: 94.9% – 98.6%) and blood lipid control (n = 273, 73.8%, 95% CI: 69.0% – 78.2%). The coverage of key interventions across sex, age, area of residence, highest education level, employment status and household income level were not significantly different by different groups indicating equity of service coverage. Effective outcomes were defined for the six domains of care. More than 50.0% of respondents were able to achieve the effective outcome only for nephropathy care (n = 332, 86.7%, 95% CI: 82.9% – 89.9%) defined as having an e-GFR $\geq$ 60mL/min/1.73 m^2 and blood pressure control (n = 250, 65.3%, 95% CI: 60.3% – 70.0%) defined as having a blood pressure reading <140/90 mmHg. The overall effective coverage of diabetes care was only 13.9% (95% CI 10.9% – 17.3%). The relative inequalities favoured the most vulnerable across sex, age, area of residence, highest education level and employment status and showed no inequities. The relative inequality was 1.4 for the household income category favouring the income groups 3, 4 and 5. However, the effective coverage of patients was not significantly different across equity stratifiers of age, sex, education, sector of residence, employment status and income.

The household economic burden was assessed based on outpatient care costs borne by 260 respondents and their families during the month preceding the interview and inpatient care costs borne by 16 during the preceding 12 months. The total median cost of an outpatient visit including direct and indirect costs of care was LKR 860.0(IQR: LKR 284.5 – 1970.0). It was significantly more for patients who obtained care from the private sector (LKR 1780.0, IQR: LKR 1000.0 –3400.0) compared to patients who sought care from the government sector (LKR 320.0, IQR: LKR 190.0 – 950.0). The highest proportion of direct costs borne by patients who sought care from the government sector institutions was spent on investigations (39.0%) whilst the cost of medicines constituted the highest proportion spent for direct costs by patients who received private sector services (42.0%). Catastrophic expenditures for diabetes care were experienced by 28 respondents (12.2%) that included 19 (14.8%) from income groups one and two. No difference in the cost burden was observed across age, sex, area of residence and employment status of respondents. People with higher educational attainment spent significantly more (LKR 1000.0, IQR: LKR 340.0 – 2245.0) than those with lower educational achievement (LKR 760.0, IQR: LKR 235.0 – 1575.5) (p

= 0.039). People in income groups three to five also spent significantly more than (LKR 1205.0, IQR: LKR 368.8 – 2276.2) people from income groups one and two (LKR 740.0, IQR: LKR 230.0 – 1612.5) (p =0.004). These findings illustrate the absence of inequities in healthcare cost burden due to diabetes mellitus at household level as observed disparities were prominent in the least vulnerable groups. One out of 16 hospital admissions was in the private sector. The total median cost of a hospital admission for diabetes or a related complication was LKR 3,990.0 (IQR: LKR 1,125.0 – 32,212.0).

Conclusions and recommendations: The unmet needs of diabetes mellitus arose mainly from a gap in awareness of the disease and its management compounded by low levels of patient empowerment for self-management. More investment is recommended for patient education initiatives and self-management education strengthened by trained human resources for delivering patient-centred collaborative care. An entry point for patient-centred collaborative care in the government sector would be the current primary care reforms where a population is empanelled to a healthcare team in the primary level hospitals providing the backdrop for establishing long-term patient-provider relationships which are beneficial for long term illnesses such as diabetes mellitus. Supplier side gaps in meeting patient needs were related to lack of resources, overcrowding of public sector healthcare institutions and lack of adherence to clinical protocols. The reported unmet needs by respondents was low. The service coverage for key interventions defined by minimal coverage criteria were suboptimal with only four out of the nine key interventions being delivered to more than 50% of respondents. The achievement of effective outcomes of care was substantially poor. The overall coverage of diabetes care failed to be effective for at least one fifth of the total sample with diabetes mellitus. Adoption of evidence-based guidelines contextualized to the local setting is highly recommended for diabetes care with national regulatory mechanisms to strengthen enforcement to improve service coverage. An essential service package that conforms to clinical practice guidelines need to be implemented to benchmark resource gaps in each level of government health sector hospitals for provisionof optimal care for diabetes. Required funding for fulfilment of identified resource gaps should be prioritized in annual budgeting of the Ministry of Health, Nutrition and Indigenous Medicine and incrementally allocated to address gross deficiencies. The service coverage and effective service coverage were equitable across selected equity stratifies. Ensuring equity in healthcare access and outcomes should be a dominant

focus of any policy or strategy to improve service coverage and the quality of services provided for diabetes mellitus. Household costs were equitably distributed. Household economic burden due to diabetes mellitus was profoundly high. Providing financial risk protection should be a priority of the government, particularly for low-income families; this can be achieved through ensuring healthcare access closer to home and strengthening service delivery through strengthening primary level healthcare institutions.

Keywords: Diabetes mellitus type 2, Universal health coverage, Effective coverage, Household economic burden, Equity of healthcare, Sri Lanka