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Impact of a Collaborative Pharmaceutical Care Service among Patients with Diabetes in Qatar Petroleum Healthcare Center Dukhan: A Multiple Time Series Study

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Abstract Background: Diabetes mellitus is a highly prevalent non-communicable disease worldwide. The prevalence of diabetes in Qatar exceeds the prevalence of diabetes in the Middle East and North Africa region and the globe. Similarly, diabetes-related complications and mortality are dramatically increasing worldwide. Poor health outcomes and debilitating consequences can result from inadequate control of diabetes. Previous studies have demonstrated the benefit of pharmaceutical care services on outcomes of diabetes. No studies were done in Qatar regarding this issue. Therefore, the objectives of this study were to: (1) characterize the clinical profile of patients with diabetes attending an ambulatory care clinic at Qatar Petroleum (QP) Medical Center including diabetes-related comorbidities and complications; (2) evaluate the impact of a Comprehensive Pharmaceutical Care Service (CPCS) on glycemic control [glycated hemoglobin A1c (HbA1c) and fasting plasma glucose (FPG)]; (3) evaluate the impact of the CPCS on diabetes comorbidities including lipid profile [low density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), triglycerides (TG), and total cholesterol (TC)], systolic blood pressure (SBP), diastolic blood pressure (DBP), and body mass index (BMI) and; (4) classify the drug-related problems (DRPs) identified by pharmacists during the follow-up period. Methods: This was a multiple time series, observational, retrospective, pre-post study among patients attending diabetes clinic at QP Medical Center in Dukhan. Primary clinical outcome measures including HbA1c, FPG, weight, BMI, SBP, DBP,

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and lipid profile were measured at baseline, 6 months, and 12 months after receiving the CPCS through a retrospective chart review of electronic medical records for the year 2016. The secondary outcome measure, the types of DRPs identified by pharmacists, was collected over the period of 12 months of initiating the CPCS and categorized into a predetermined classification system. Data analyses were performed using IBM SPSS® version 23.0. Primary clinical outcome measures were analyzed inferentially using Repeated Measure ANOVA to determine the impact of the intervention. Sociodemographic characteristics, basic clinical characteristics, baseline and current medications regimens, and types of DRPs identified by pharmacists were analyzed descriptively using frequencies, percentages and means as appropriate. Results: A total of 96 eligible patients with diabetes were included in the study. CPCS significantly improved the following parameters from baseline to 6 and 12 months: HbA1c (8.5%, 7.4%, 7.1%, respectively; P <0.001), FPG (154.1 mg/dL, 115.4 mg/dL, 112.8 mg/dL, respectively; P <0.001), weight (79.9 Kg, 78.3 Kg, 76.9 Kg, respectively; P <0.001), BMI (29.1 Kg/m2, 28.5 Kg/m2, 28.1Kg/m2, respectively; P <0.001), SBP (140.2 mmHg, 129.1 mmHg, 125.3 mmHg, respectively; P <0.001) and DBP (84.7 mmHg, 79.5 mmHg, 76 mmHg, respectively; P <0.001). However, no significant reductions from baseline to 6 and 12 months were observed in LDL-C (2.7 mmol/L, 2.8 mmol/L, 2.7 mmol/L, respectively; P =0.702), HDL-C (1.2 mmol/L, 1.2 mmol/L, 1.3 mmol/L, respectively; P =0.551), TG (1.6 mmol/L, 1.7 mmol/L, 1.7 mmol/L, respectively; P =0.728), and TC (4.3 mmol/L, 4.3 mmol/L, 4.1 mmol/L, respectively; P =0.101). The most prevalent three DRPs identified were lack of understanding of the medication (39.8%), inappropriate dose, form, schedule, route, or method of administration (17.3%), and actual and potential adverse events (14.3%).
Conclusion: The provision of CPCS in a primary healthcare setting in Qatar improves clinical outcomes in patients with diabetes over a 12-month follow-up period. Future studies are needed to determine the long-term outcomes of CPCS.