



COST ASSOCIATED WITH UNCONTROLLED TYPE 2 DIABETES MELLITUS IN TWO TERTIARY HEALTHCARE FACILITIES IN A RESOURCE-LIMITED SETTING.

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INTRODUCTION: The cost of diabetes mellitus has continued to increase over the years largely due to increase in epidemiological transition and treatment non-adherence (1, 2). This study focused on cost of managing Type 2 diabetes mellitus (T2DM) patients with poor glycemia control in ambulatory settings.

METHODS: This was a retrospective and prospective study among type 2 diabetes mellitus patients attending two tertiary healthcare facilities in Southwestern Nigeria between June 2016 and July 2018. Interview-administered semi-structured questionnaire was used to retrieved information from the patients. Information retrieved included; socio-demographics information and relevant disease-specific clinical parameters. Adherence to dietary modification was assessed using Perceived Dietary Adherence Questionnaire (PDAQ) (3), while physical activities was assessed using International Physical Activity Questionnaire (IPAQ)-Short form. Treatment non-adherence was assessed using glycated hemoglobin (HbA1c). Ninety-five patients with HbA1c<7% were assigned to controlled group and 106 patients with HbA1c≥7% were assigned to intervention group. A six-month educational intervention was provided for the intervention group which focused largely on resolving non-adherence to recommended treatment (medications, diet and physical activity). Direct cost (out-of-pocket) estimated for medications, transportation, consultation and laboratory investigations was calculated for six-month retrospective data and six-month post-intervention management for both groups in US dollar. Data were evaluated for both groups using paired t-test with p<0.05 considered significant.

RESULTS: Patients’ mean age was 62.9±11.64years, while average monthly income was \$183.2±249.0. Average six-month pre-intervention cost of management for control and intervention groups were \$293.0±127.7 and \$330.5±120.7 respectively. The cost reduced to \$292.0±135.5 (p=0.93) among the controlled group and increased to \$336.3±160.8 (p=0.155) among the intervention group after the educational intervention.

Table 1: Clinical outcome, adherence to recommended diet and physical activities among T2DM patients

Outcome	Control group (<7.0%)			Intervention group (≥7.0%)		
	0 Month (Mean±SD)	6 Month (Mean±SD)	P value	0 Month (Mean±SD)	6 Month (Mean±SD)	P value
Systolic B.P (mmHg)	129.3 ±18.2	125.3±15.9	P=0.004*	136.9±20.7	131.0±19.9	P=0.002*
Diastolic B.P (mmHg)	77.1±8.9	75.3± 8.0	P=0.068	80.2±10.4	78.3±9.6	P=0.074
HbA1c (%)	6.13±0.6	6.14 ±0.8	P=0.877	8.67 ±1.5	7.81 ±2.0	P<0.001*
Mean PDAQ	56.3±4.0	56.5±3.9	P=0.094	51.8±8.8	56.4±4.3	P<0.001*
IPAQ (Metabolic Equivalent per week)	901.4±743.5	911.7±752.6	P=0.327	775.2±711.5	829.3±695.5	P<0.001*

* Significant with paired t- test , SD - Standard Deviation, HbA1c - Glycated hemoglobin, B.P- Blood Pressure

DISCUSSION: The educational intervention among the intervention group had a positive effect on the dietary modification and physical activities as well as the clinical outcome of the patients resulting in all overall decrease in HbA1c, although the target value of <7% (4) was not attained. It is expected that this can be attained if the patients continue with their recommended treatment as guided during the study. In addition, some cost items (Cost of consultation, transport fare and laboratory investigations) decreased from the baseline value (0 month) significantly. The increase in cost of diabetes medications among the intervention group could be due to the uncontrolled blood glucose at baseline which might have necessitate increase in medication doses or possible changes in medication(s) by the attending physician.

CONCLUSION: Educational intervention on treatment non-adherence led to significant improvement in glycemia control of the intervention group with an insignificant increase in cost of management. Thus, the need for consistent treatment adherence among patients in order to reduce the burden of the disease.

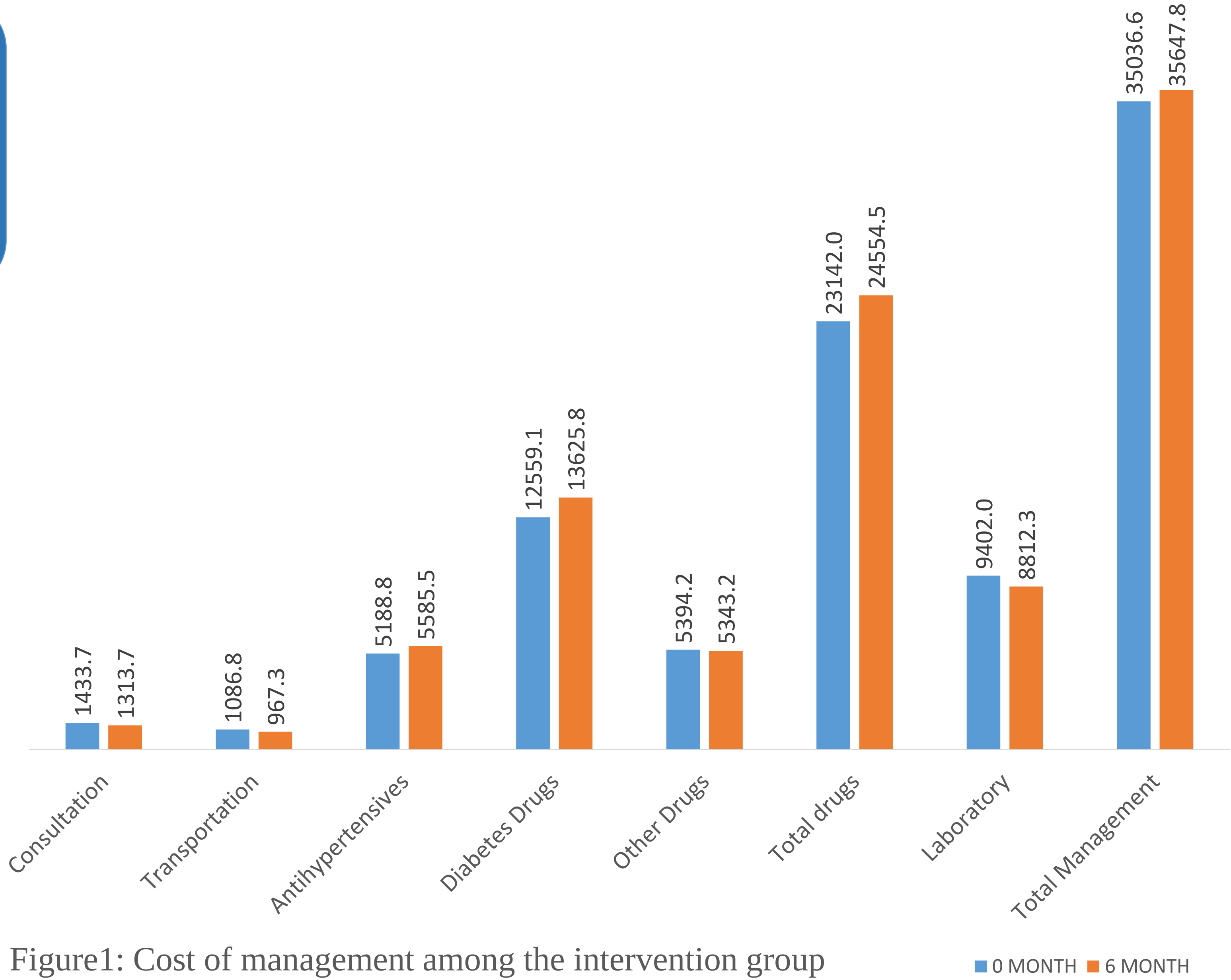


Figure1: Cost of management among the intervention group

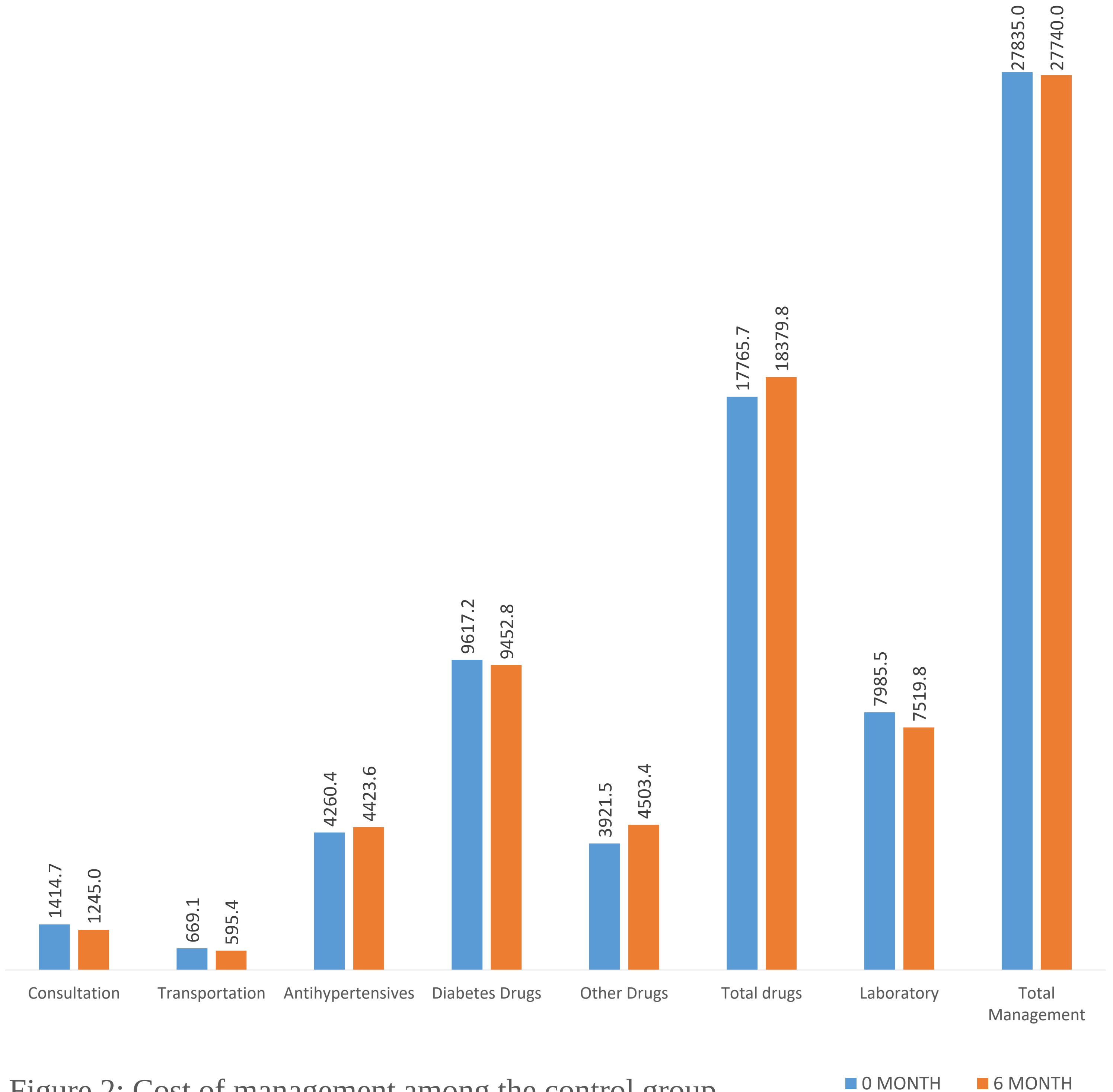


Figure 2: Cost of management among the control group

References:

1. WHO (2016). Global Report on Diabetes. https://apps.who.int/iris/bitstream/handle/10665/204871/9789241565257_eng.pdf;sequence=1. Assessed 29th October, 2019.
2. Hu F.B. 2011. Globalization of diabetes. The roles of diet, lifestyle and genes. Diabetes Care 34:1249–1257. 1): S55-S64. <https://doi.org/10.2337/dc18-S006>
- 3.Asaad G, Sadegian M, Laum R, Xu Y, Soria-Contreras DC, Bell C and Chan CB. The Reliability and Validity of the Perceived Dietary Adherence Questionnaire for People with Type 2 Diabetes. Nutrients 2015, 7(7), 5484-5496; <https://doi.org/10.3390/nu7075231>
4. American Diabetes Association. (2018). Glycemic Targets: Standards of Medical Care in Diabetes—2018. Diabetes Care; 41(Supplement 1): S55-S64. <https://doi.org/10.2337/dc18-S006> . Assessed 30 October, 2019.