

# Quality of Life and Glycaemic Assessment Before and After Pump School

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## BACKGROUND

- Type 1 diabetes (T1DM) is one of the most common chronic diseases in childhood with an estimated incidence rate of 29.0 per 100,000 per year in the Republic of Ireland<sup>1</sup>.
- Poorly controlled T1DM is associated with a range of acute and long term complications including microvascular and macrovascular problems, short- and long-term adverse effects on cognitive functioning, and poor psychosocial functioning<sup>2</sup>.
- Improvement in a range of health outcomes, including glycaemic control<sup>3</sup>, health-related quality of life (HRQOL) and family burden<sup>4</sup> have been demonstrated following the commencement of insulin pump therapy in paediatric populations.

## OBJECTIVES

- To examine HbA1c trends prior to initiating insulin pump therapy and for 12 months following commencement of pump therapy.
- To evaluate changes in health-related quality of life and family burden in children with T1DM and their families following the commencement of insulin pump therapy.

## METHODOLOGY

### Design

- A prospective cohort study, spanning over 12 months, was implemented.
- A within-subjects design was used to assess health outcomes pre- and post-insulin pump therapy.

### Methods

- Eligible (Kaufman competency 5/8) children (n=53, Mean age 10.5 years, 51% female) with T1DM, previously treated with multiple daily injections (MDI), were involved in the study.
- Children, parents, extended family and teachers were invited to a novel two day structured educational programme, 'Pump School', delivered by a Consultant Led MDT.
- Each Pump School included two age-matched children.
- Insulin Pump therapy was initiated during the second day of Pump School.
- HRQOL (Diabetes Quality of Life for Youths; DQOLY), family burden (Questionnaire for Parents of Children and Adolescents with Diabetes) and HbA1c were recorded pre-insulin pump therapy and at 3, 6 and 12 months following pump school.

## RESULTS

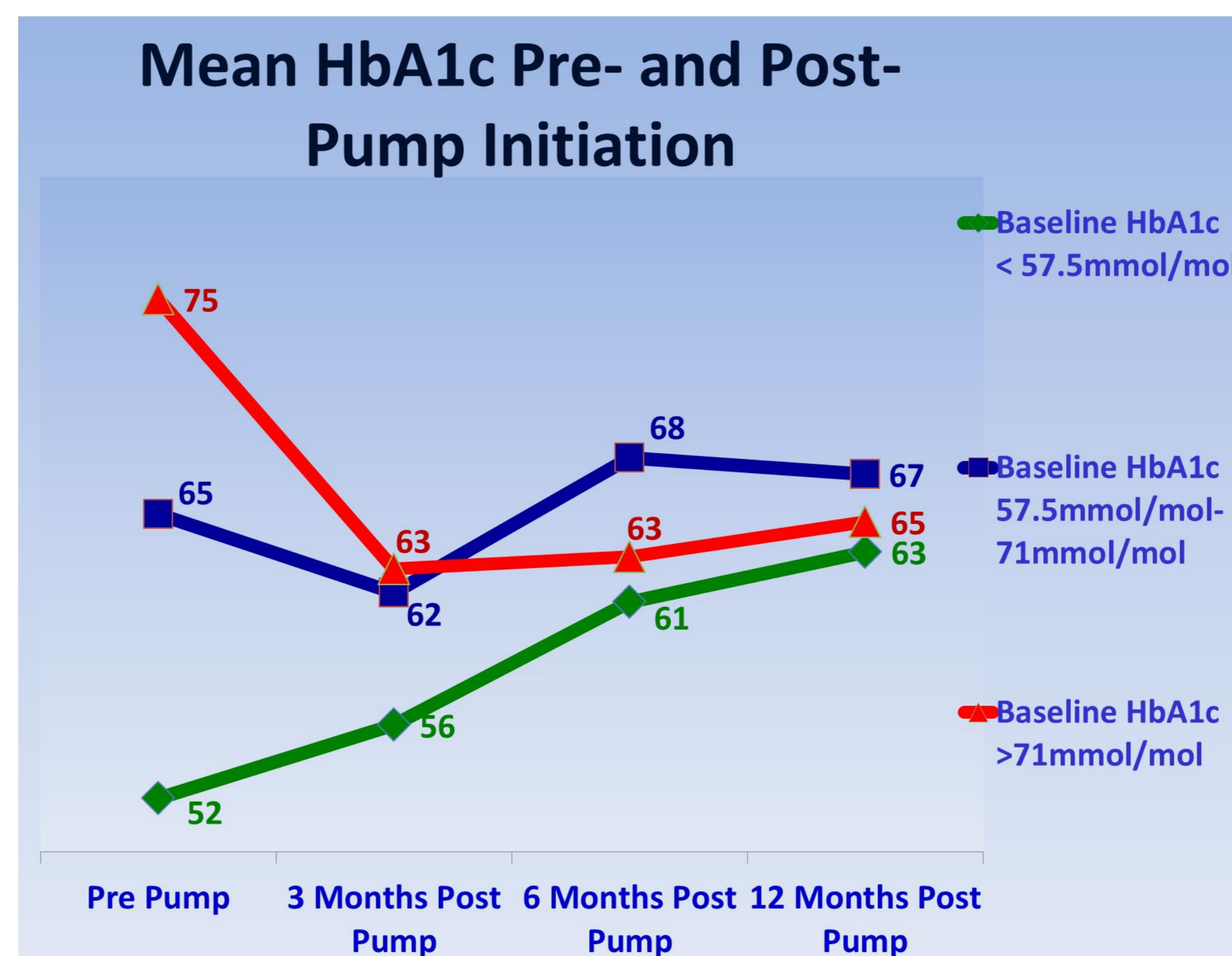


Figure 1: Showing average HbA1c levels in patients who have been grouped according to their baseline (pre-pump) HbA1c.

- A significant ( $p < 0.01$ ) reduction from baseline HbA1c was recorded at 3, 6 & 12 months follow-up for the high baseline HbA1c group. Patients with low baseline HbA1c showed a significant ( $p < 0.05$ ) increase in HbA1c at 3, 6 & 12 months following initiation of insulin pump therapy.

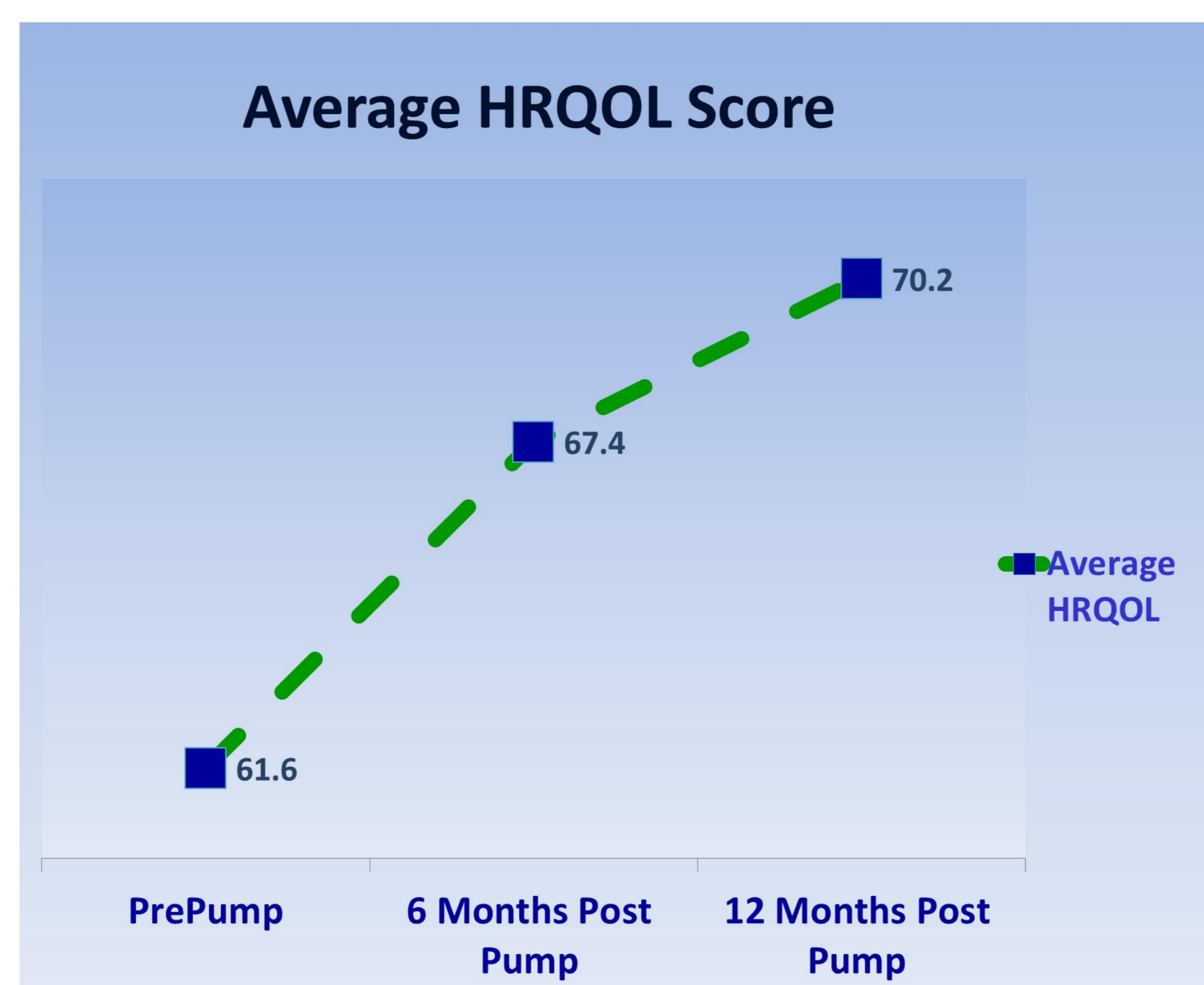


Figure 2: Showing average scores on the DQOLY.

- Student t-tests showed a significant ( $p < 0.05$ ) increase from pre-pump HRQOL scores at 6 & 12 months following insulin pump initiation.

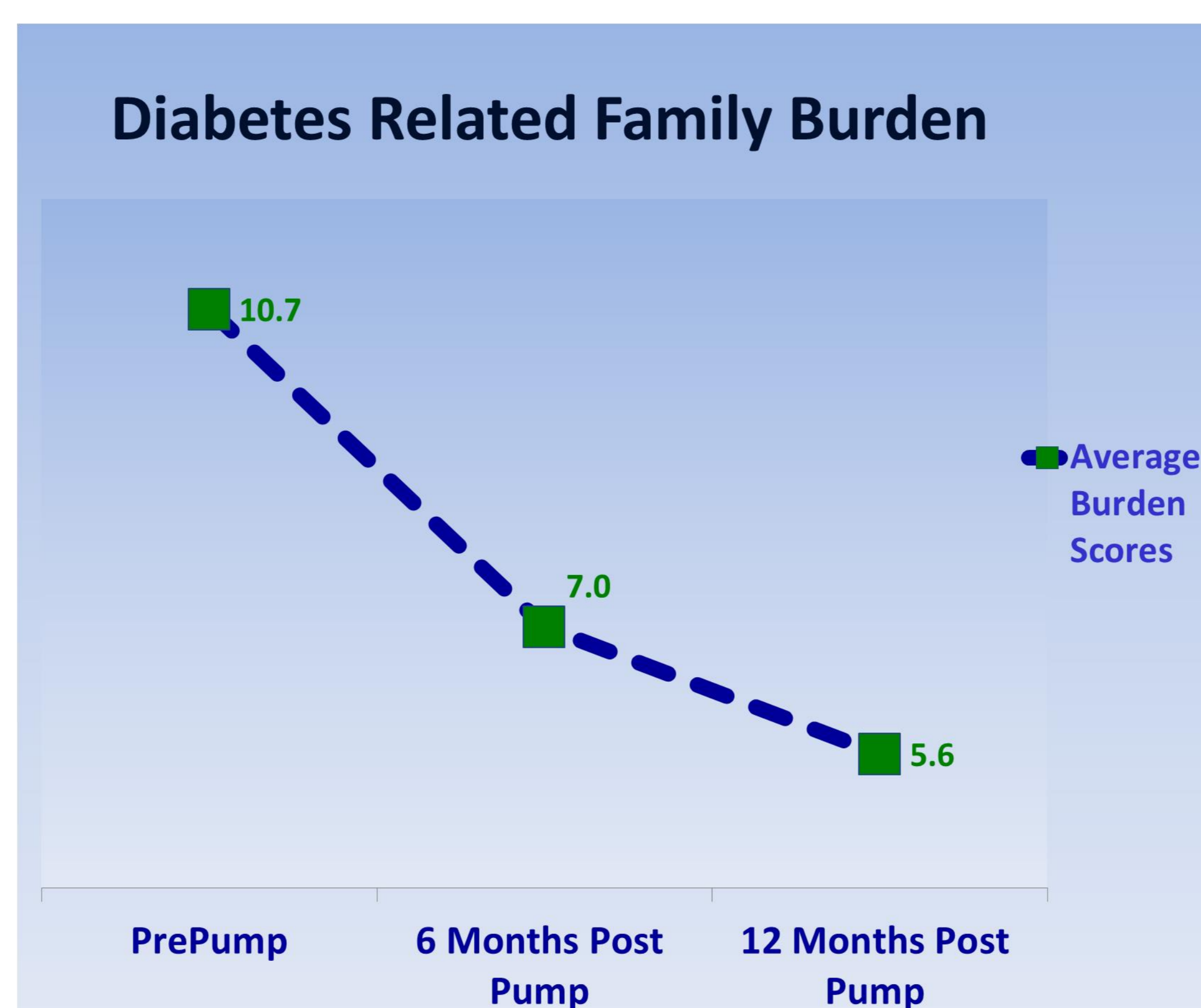


Figure 3: Showing average scores on the Questionnaire for Parents of Children and Adolescents with Diabetes.

- Student T-tests showed a significant reduction in family burden scores at 6 ( $p < 0.001$ ) & 12 months ( $p < 0.01$ ) following the commencement of insulin pump therapy.

## DISCUSSION

- Similar to previous research<sup>5</sup>, patients with higher baseline HbA1c showed significant improvement in glycaemic control shortly after commencing insulin pump therapy and this improvement was maintained throughout the study period.
- In contrast, patients with lower pre-pump HbA1c showed a significant increase in HbA1c following initiation of insulin pump therapy.
- Since the majority of patients in the low-baseline group had HbA1c levels below the normal range (52mmol/mol), increased HbA1c in this group is considered a positive outcome of insulin pump therapy as it reflects a reduction in the number of hypoglycaemic episodes.
- Patients reported a significant and sustained improvement in HRQOL after commencing pump therapy. Improvement was evident across a wide range of physiological, psychological and social factors such as impact of symptoms, impact of treatment and impact on daily activities.
- Parents reported a significant reduction in diabetes related family burden once insulin pump therapy commenced.

## CONCLUSIONS

- Findings suggest substantial improvement in bio-psychosocial functioning following the initiation of insulin pump therapy.
- Improvements in glycaemic control were evident for those patients who struggled to maintain good glycaemic control on a MDI regime.
- HRQOL and family burden improvements were maintained one year after Pump School.
- Further research is warranted to determine whether improvements are maintained longitudinally.

## REFERENCES

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