



# Evaluation of FreeStyle Libre Flash Glucose Monitoring System on glycemic control, health-related quality of life, and fear of hypoglycemia in patients with type 1 diabetes



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## Introduction

- **Background:** Type 1 diabetes mellitus (T1DM) imposes major lifestyle challenges for adolescents. Fear of hypoglycemic (FOH) episodes resulting from daily, fluctuating levels of glucose, adversely impacts patients' quality of life (QoL).

## Objective

To evaluate the effect of FreeStyle Libre (FL) Flash Glucose Monitoring (FGM) system on glycemic control, hypoglycemia, health-related quality of life (HR-QoL), and the fear of hypoglycemia (FOH) among children and young people with type 1 diabetes (T1D).

## Design and Setting

A prospective study was conducted at the Diabetes Treatment Center, Prince Sultan Military Medical City, Riyadh, Saudi Arabia between November 2016 and March 2017 on 47 registered T1DM patients aged 13–19 years. The FGM sensors were placed on each participant by a trained diabetes educator. The data collected from the sensors were computed to generate the respective ambulatory glucose profiles so as to determine the total number of scans conducted during the study period. At the baseline and at 3 months of the experiment, a trained interviewer administered the Questionnaire of Hypoglycemia Fear Survey-Child Version (HFS-C) and PedsQL 3.0 (HR-QoL questionnaire) to each patient.

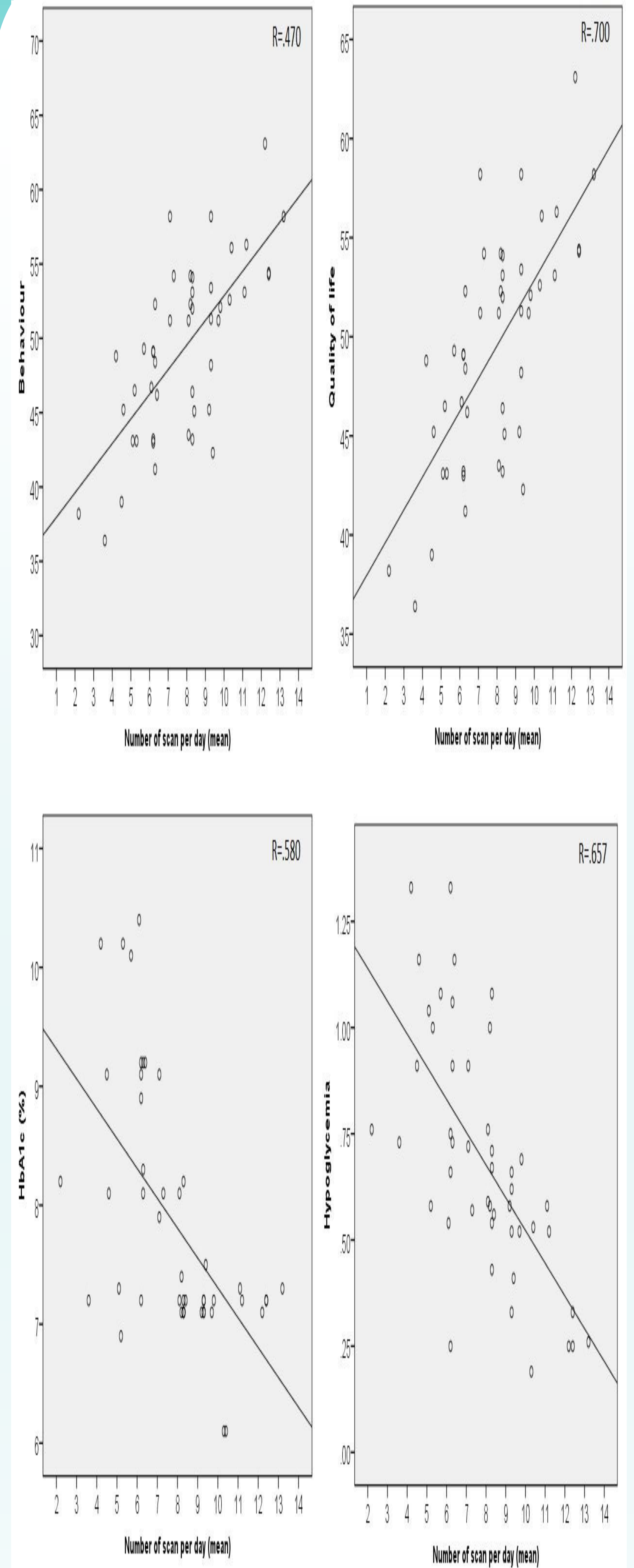
The age, gender, weight, height, adjusted body mass index (BMI), duration of diabetes, treatment modality, and glycosylated hemoglobin (HbA1c) levels of each patient was recorded.

## Results

- As compared to that at the baseline, a significant positive improvement was noted in the behavior of FOH ( $p = 0.012$ ), QoL ( $p = 0.005$ ), HbA1c level ( $p = 0.002$ ), and hypoglycemia ( $p = 0.034$ ) at 3 months. As compared to patients treated with insulin pumps, a significant positive improvement was noted in the HbA1c level ( $p = 0.001$ ) and hypoglycemia ( $p = 0.001$ ) among the MDI-treated patients. Significant improvements were also noted in behavior (0.682), worry (0.831), QoL (0.177), HbA1c level (-0.626), and hypoglycemia (-2.60). A positive correlation was recorded in the behavior ( $r = 0.47$ ), QoL ( $r = 0.70$ ), HbA1c level ( $r = 0.580$ ), hypoglycemia ( $r = 0.657$ ), and the total number of FGM scans.

## Conclusion

The frequent use of FGM scanning reduced the frequency of hypoglycemia, HbA1c level, and the FOH and increased the HR-QoL. As compared to self-testing by the conventional finger-pricking method, the use of FGM increased the frequency of self-testing and thus diabetes control.



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