

Association and Predictive Value of Family Socioeconomic, Mental, and Physical Health Status for Glycemic Control among Children with Type 1 Diabetes

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ABSTRACT

To assess the prevalence of poor glycemic control in type 1 diabetes mellitus (T1 DM) patients and identify its key clinical, socioeconomic, behavioral, and family-related determinants. A cross-sectional descriptive analytic study. The study was conducted between January and May 2026. Information was collected from two healthcare facilities: Al-Wafaa Specialist Center for Diabetes and Endocrinology and the endocrine unit of Al-Khansaa Teaching Hospital, Mosul, Iraq. For 340 children and adolescents with T1 DM, we compared controlled (HbA1c ≤ 7 , n=38) versus uncontrolled (HbA1c $>7\%$, n=302) groups across comprehensive demographic, clinical, and behavioral variables using binary logistic regression and ROC curve analysis. About 89% of patients had poor glycemic control (mean HbA1c 9.78 ± 2.149). Uncontrolled patients were significantly older ($P = 0.021$) with longer disease duration ($P = 0.035$). Several socioeconomic and behavioral factors were significantly associated with poor glycemic control, including infrequent blood glucose monitoring, lower paternal educational level ($P = 0.002$), larger family size ($P = 0.001$), mother as a single caregiver ($P = 0.001$), and poor adherence to dietary recommendations ($P = 0.001$). On logistic regression analysis, seven factors were significantly associated with the glycemic control; four of them were protective. The strongest protective factor was family adherence to dietary recommendations (OR=0.170, 95% CI: 0.086-0.338, $P < 0.001$), while large family size increased the risk of poor control (OR=4.740, 95% CI: 1.917- 11.725, $P = 0.001$). A reduced model using only the seven significant predictors achieved good discrimination (AUC=0.860), while the full model including all 16 candidate variables achieved excellent discrimination (AUC=0.876). Glycemic control is unsatisfactory and is driven by people's behavior and family factors. Ways to introduce multidisciplinary family-centered care and to tackle issues related to dietary practices, parental education, and self-monitoring of glucose levels need to be found immediately to ensure successful treatment of affected individuals.

Keywords: Children; HbA1c; glycemic control; socioeconomic; Type1diabetes.

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