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Parental Diabetes Knowledge and Its Association with Glycaemic Control in Finnish Children with Type 1 Diabetes

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Abstract

Objective: Family-oriented self-management education is an essential component of diabetes care for achieving treatment objectives in Type 1 Diabetes (T1D). This study aimed to assess how caregiver knowledge of diabetes affects glycaemic control in children and adolescents with T1D. We investigated determinants associated with parental diabetes knowledge and its effect on the child's glycaemic control. Research Design and Methods: Finnish-speaking children aged < 16 years with a T1D duration of > 1 year and their caregivers were enrolled in the study at an outpatient visit for the child. A questionnaire on family background information was administered at the time of enrolment. One or both caregivers completed a diabetes knowledge test. Medical personnel extracted diabetes-related information from the child's medical records. Statistical analyses were conducted to explore the effect of parental diabetes knowledge on the child's glycaemic control. Results: One hundred ninety-nine families were enrolled. We found no correlation between parental diabetes knowledge and glycaemic control of the child. A higher level of parental education was associated with better diabetes knowledge. Mothers demonstrated slightly better knowledge than fathers and caregivers' knowledge improved over time, up to 6 years after the child's diagnosis. Caregivers with diabetes themselves did not show improved diabetes knowledge or better glycaemic control in their child. Only insulin pump users appeared to achieve good glycaemic control (glycosylated haemoglobin HbA1c < 53 mmol/mol) more easily when the level of diabetes knowledge of the caregivers was higher. Conclusions: Our findings suggest that additional parental education may not improve glycaemic control once a basic level of diabetes knowledge has been attained. Thus, the glycaemic control of children with T1D may depend more on other factors than parental diabetes education.

Keywords: Diabetes • Paediatrics • Glycaemia • Education • Caregivers • Knowledge • Finland

Introduction

Type 1 Diabetes (T1D) is one of the most common chronic diseases in childhood [1,2]. In 2021, approximately 108,300 children and adolescents aged < 15 years were diagnosed with T1D globally. An estimated 1,211,900 children and adolescents aged < 20 years are living with the condition [2,3]. In Finland, the incidence of T1D in children aged < 15 years has been the highest in the world for several decades, with 52.2 cases per 100,000 recorded in 2018 [4]. Glycated haemoglobin (HbA1c) < 53 mmol/mol and a Time in Range > 70% are recommended by the American Diabetes Association and the International Society for Pediatric and Adolescent Diabetes (ISPAD) for most children with T1D [5,6]. The Diabetes Control and Complication Trial was the first study to clearly demonstrate that prolonged optimal glycaemic control reduces the risk of microvascular and macrovascular complications in patients with T1D [7].

As stated in the ISPAD Guidelines, education is the foundation of effective diabetes care [8]. Family-oriented self-management education is a key component in achieving treatment goals in T1D [6,8]. Nutritional education, including systematic carbohydrate assessment and the use of insulin-to-carbohydrate ratios, supports the optimisation of insulin treatment [9,10]. Interpretation of glucose self-monitoring data, increasingly carried out by continuous glucose sensoring, requires an advanced skill to guide adjustment of insulin treatment and maintain target glycaemia. Age-appropriate physical activity is also an important component of T1D management [6,11]. The use of hybrid closed-loop systems has shown potential to improve both glycaemic outcomes and quality of life in children with TID [12,13]. To achieve these outcomes, it is crucial to apply all available methods to enhance adherence to intensive insulin therapy. Therefore, structured and ongoing diabetes education for patients and families is essential [6,8]. The goal is to help families integrate diabetes-specific knowledge into daily diabetes management tasks.

This study aimed to determine whether caregiver knowledge of diabetes affects glycaemic control in children and adolescents with T1D. We also assessed the factors associated with parental knowledge of diabetes.

Materials and Methods

Participants and protocol

This cross-sectional study was conducted at the paediatric diabetes outpatient clinic of Tampere University Hospital, Finland. Children and adolescents with T1D and their families were invited to participate in the study. Eligibility criteria included age between 1 and 16 years, a T1D duration of at least 1 year and Finnish-speaking family members. If multiple siblings in a family had T1D, only the oldest was included. The study was approved by the Ethics Committee of the Pirkanmaa Hospital District.

Glossary: *T1D = Type 1 Diabetes; HbA1c = glycosylated haemoglobin; TIR = Time in Range; ISPAD = Intenational Society for Pediatric and Adolescent Diabetes; T2D = Type 2 Diabetes; r = Pearson correlation coefficient; CI = Confidence Intervals; OR = Odds Ratio; IQR = Interquartile Range; SD = Standard Deviation*

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During an outpatient clinic visit, children and their guardians received information about the study and gave their written informed consent to participate. Caregivers completed a questionnaire on family background information and one or both guardians completed the diabetes knowledge test during the same appointment. If there was not enough time to complete the questionnaire at the clinic, participants were given a pre-paid envelope to mail their responses from home. A healthcare professional collected diabetes-related information from the patient's medical records. Data collection took place during 2020–2021.

At the time of the study, 429 children aged < 16 years were followed up in the paediatric diabetes clinic of the Tampere University Hospital. Of these, 334 children were eligible for inclusion. The most common reason for ineligibility was a short duration of diabetes. Among the invited families, 199 (60%) agreed to participate in the study (Figure 1). No information was collected from those patients who declined to participate.

Measurements

Background information questionnaire: The questionnaire was developed specifically for this study to collect background information. It included the caregivers' level of education (primary school, high school graduate, college, university of Applied Sciences, university, or other) and caregivers' diabetes status (diabetes: yes/no, type of diabetes: T1D / Type 2 Diabetes (T2D) / other, duration of diabetes, mode of treatment, the most recent glycosylated haemoglobin (HbA1c) and possible complications related to diabetes).

Diabetes knowledge test: A diabetes knowledge test for parents was specifically developed for this study. Prior to recruitment, the questionnaire was tested in our clinic by paediatric diabetes nurses (n = 7) and nurses from the paediatric neurological clinic (n = 6). The paediatric neurology nurses were selected as controls because they are healthcare professionals without specific expertise in T1D and their background was considered most comparable to that of the parents of children with T1D. In contrast, the diabetes nurses from the paediatric clinic were considered the most competent controls to complete the questionnaire and their diabetes-related knowledge was assumed to be at a high level. The diabetes nurses achieved an average score of 97% correct answers (range: 93–98%), whereas the paediatric neurology nurses achieved an average of 64% (range: 56–82%). These results suggest that the test was sufficiently specific and appropriately challenging to assess diabetes knowledge and thus suitable for use in this study.

The diabetes knowledge test (Supplementary material) was intended to be completed by one parent; however, completion by both parents was also permitted. Caregiver 1 was designated as the female parent and caregiver 2 as the male parent. In the case of a female couple, the second mother was designated as caregiver 2. We primarily used the percentage of correct answers from caregiver 1. The questionnaire consisted of multiple-choice questions and true-false-uncertain questions, with each correct answer awarded one point. The questionnaire consisted of nine items that focused on daily life with T1D: glucose monitoring and self-analysis (2 questions), insulin (12 questions), diet (3 questions), targets of glycaemic control (8 questions), causes and treatment of hyperglycaemia (8 questions), ketones and diabetic ketoacidosis (9 questions), hypoglycaemias and use of glucagon (9 questions), physical activity (7 questions) and infections (3 questions) (Supplementary Material). Higher scores indicated better diabetes knowledge. The sum score of the scale ranged from 0 to 61. For data analysis, scores were converted to percentages of correct answers (0–100 %).

Demographic and diabetes measures

Demographic data (sex and age) and data related to diabetes (HbA1c, insulin delivery method and time from diagnosis) were collected from the patients' medical records at the time of recruitment. HbA1c was determined using either a point-of-care analyser (Siemens DCA Vantage) or a standard immunological assay in a laboratory. The insulin pumps and sensors in use at the time of recruitment were MiniMed™ 640G, MiniMed™ 670G (Medtronic), Omnipod® Eros, Omnipod DASH® (Insulet Corporation); and respectively FreeStyle Libre 1 or 2 (Abbott), Dexcom G6 (Dexcom Inc.) and Guardian™ 3 or 4 (Medtronic).

Data analysis

Participant characteristics were described by using frequencies with percentages, means with standard deviation, or medians with interquartile ranges and/or ranges. For continuous variables, differences between groups were tested using an independent samples t-test or one-way analysis of variance. For categorical variables, Pearson's chi-square or Fisher's exact test was used.

In the subgroup analysis of parental T1D, the data of caregivers with other types of diabetes than T1D (T2D n=6, gestational diabetes n=8, other n=1) were excluded to focus specifically on T1D.

Differences in the percentage of correct answers on the knowledge test between caregivers were tested using a paired samples t-test. The correlation

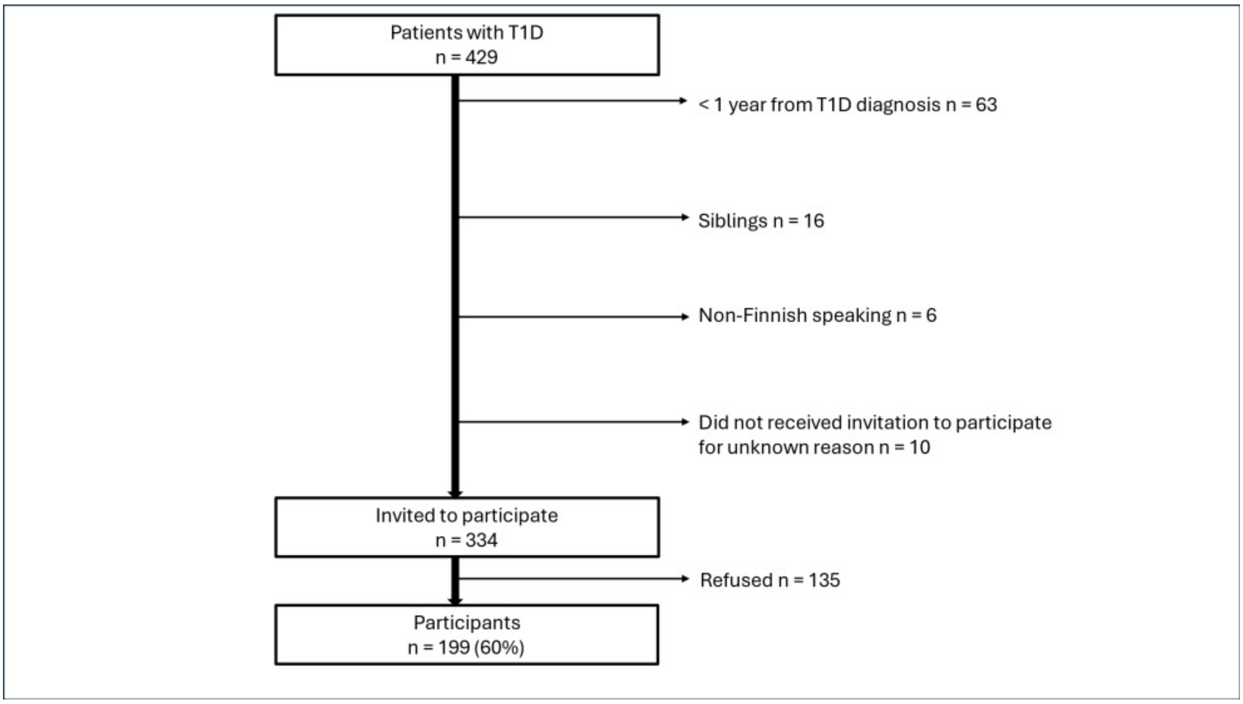

Figure 1. T1D = type 1 diabetes, n = number of participants.

between caregiver 1 and caregiver 2 scores was calculated using the Pearson correlation coefficient (r) with 95% Confidence Intervals (CI), p-values and the number of paired responses reported.

For analysis of the combined dataset, we primarily used the percentage of correct answers from caregiver 1. If caregiver 1 data were missing, caregiver 2 responses were used. This approach was justified by a moderate correlation between the two caregivers' scores (Figure 2).

The risk factors for achieving optimal glycated haemoglobin (HbA1c) levels were examined using logistic regression analyses. The threshold for the optimal HbA1c level (<53 mmol/mol) was defined according to the current guidelines [5,6]. Both unadjusted and multivariable adjusted logistic regression models were conducted to explain an optimal glucose level using insulin delivery method (multiple-dose injections/pump), sex (girl/boy), continuous age of children, time from T1D diagnosis and caregiver's knowledge of diabetes as candidates for explanation. Owing to the skewed distribution of time since diagnosis, values were log-transformed using the natural logarithm. Results were reported using Odds Ratios (OR) with 95% Confidence Intervals (CI) and p-values. To confirm the findings, we also used backward stepwise linear regression analysis (data not shown).

Statistical analyses were carried out with SPSS (SPSS Inc., IBM Corp, Armonk, NY, USA), version 28.0. The two-sided p-value <0.05 was considered statistically significant. No adjustment for multiple tests was applied and p-values should be interpreted exploratorily only.

Results and Discussion

General characteristics

Altogether, 199 children and adolescents (52% boys) with a median age of 11 years participated in the study. At recruitment, the median time since T1D diagnosis was 4 years and the median HbA1c was 59 mmol/mol (range 39–130). The most common mode of insulin delivery was an insulin pump (54%, n=107). The remaining children were treated with multiple daily insulin injections.

The diabetes knowledge test was completed by 187 female caregivers, referred to here as caregiver 1. The number of responses from caregiver 2 was 184. Two of the caregivers 2 were females (1%). The background information questionnaire was completed by at least one of the caregivers in all 199 families. More detailed demographic and diabetes-related data of the caregivers are presented in Table 1.

Parental educational level and diabetes knowledge

Table 2 shows that a higher level of education led to a better score on the diabetes knowledge test in both caregivers (p=0.020 for caregiver 1 and p=0.014 for caregiver 2).

Parental diabetes knowledge within the same family

The diabetes knowledge test was completed by both caregivers in 74 families. The mean difference between the correct response rates of the caregivers was 4.9 percentage points (p<0.001, n=74). The mean percentage of correct answers in the knowledge test was better for the caregiver 1, of whom 100% were females (mean 84.4%, SD 8.5%), than for the caregiver 2 (99% males, mean 79.4%, SD 8.1%).

The percentages of correct answers in the diabetes knowledge test of caregivers correlated moderately and explained each other 24.4% (Figure 2).

Child's T1D duration and parental diabetes knowledge

The percentage of correct answers in the parental diabetes knowledge test correlated positively with the duration of the child's T1D. For caregiver 1, the Pearson correlation coefficient r = 0.339 (95% CI 0.197-0.468, p<0.001, n = 165), caregiver 2: r =0.251 (95% CI 0.065-0.420, p = 0.009, n = 108) and combined version of caregivers 1 and 2: r = 0.273 (95% CI 0.139-0.397, p<0.001, n = 199). The association between diabetes knowledge of caregivers and the child's duration of T1D was not linear. The knowledge seemed to improve with the duration of the disease of the child up to 6 years but then started to decline (Figure 3). Nevertheless, the linear increase in caregiver diabetes knowledge was observed across all age groups during the first 6 years after diagnosis (Figure 4).

Effects of parental T1D on diabetes knowledge among caregivers and glycaemic control of children

Among the study population, 12.6% of the children had a parent with T1D. Parental TID was not associated with higher caregivers' knowledge of diabetes or improved glycaemic control in the child.

The mean percentage of correct answers for caregiver 1 with T1D was 85.1% (SD 7.8, n=20) and the mean percentage of correct responses of

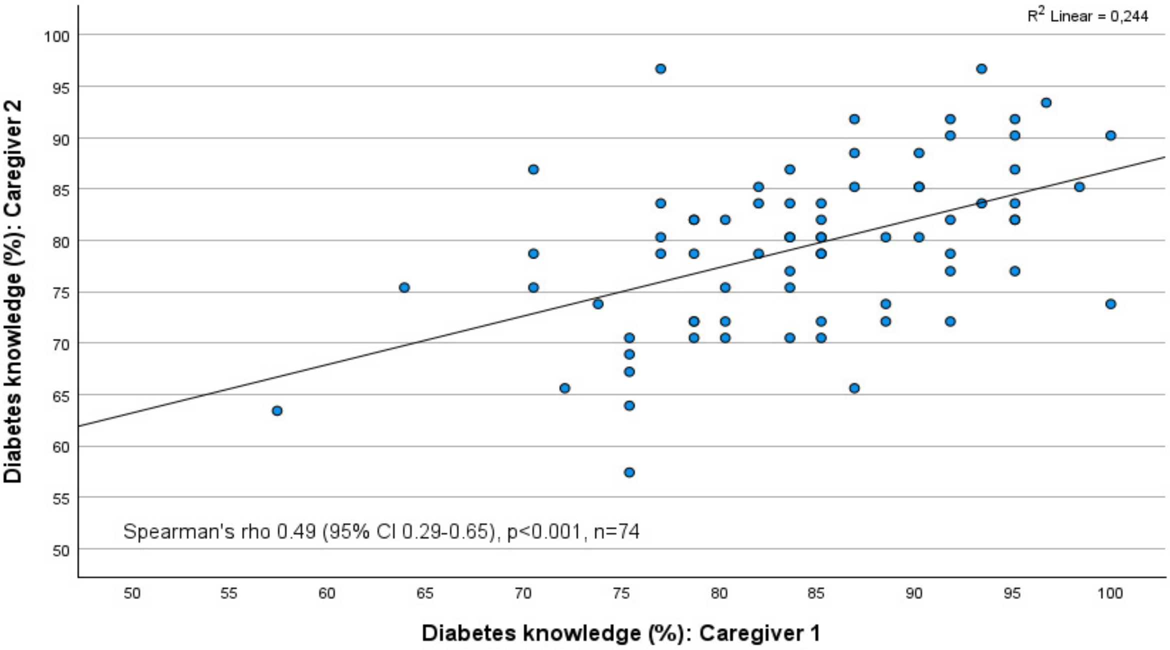

Figure 2. Moderate correlation between the two caregivers' scores.

Table 1. Characteristics of caregivers.

	Caregivers N=199			
	Caregiver 1		Caregiver 2	
	(n=187)		(n=184)	
Sex of caregiver, n (%)				
Females	187	(94)	2	(1)
Males	0		182	(91)
Missing data	12	(6)	15	(8)
Parental educational level, n (%)				
Primary school	2	(1)	4	(2)
High school graduate	10	(5)	7	(4)
College	71	(36)	71	(36)
University of Applied Sciences	55	(28)	54	(27)
University	47	(24)	42	(21)
Other*	2	(1)	5	(3)
Missing data	12	(6)	16	(8)
T1D of caregiver known, n (%)	13	(7)	12	(6)
Time from T1D diagnosis, (years), Median (IQR, range)	27	(12–32, 5-36)	22	(7–35, 2–43)
Caregiver's HbA1c known, n (%)	9	(5)	9	(5)
HbA1c, Mean (SD)	65	(18)	63	(9)

T1D = type 1 diabetes,
HbA1c = glycosylated haemoglobin,
IQR = interquartile range,
SD = standard deviation,
n=number of participants,
* = apprenticeship, institute-level educations, specialist vocational qualification

Table 2. Percentage of correct answers and parental education level.

	Percentage of correct answers					
	Caregiver 1 (n=165)			Caregiver 2 (n=108)		
	N	Mean	(SD)	N	Mean	(SD)
Percentage of correct answers	165	82.9	(8.7)	108	79.1	(7.7)
Parental educational level						
Primary school	2	69	(9.3)	2	68	(6.2)
High school graduate	8	80	(8.4)	4	79	(4.8)
College	61	81	(9.4)	38	78	(7.2)
University of Applied Sciences	45	84	(8.2)	35	78	(7.8)
University	38	86	(7.7)	24	83	(7.1)
Other	2	83	(12.7)	3	81	(8.1)
Not known	9	83	(6.4)	2	76	(8.1)

SD = standard deviation,
N = number of participants

caregiver 2 with T1D was 77.9% (SD 8.0, n=13). No differences were found when these results were compared with caregivers without T1D (caregiver 1: 82.5%, SD 8.8, n = 145, p = 0.226 and caregiver 2: 79.2%, SD 7.7, n = 95, p = 0.570).

The mean HbA1c of children having a parent with T1D was 64.1 mmol/mol (SD 14.2, n = 25) and the mean HbA1c of those without a parent with T1D was 60.4 mmol/mol (SD 12.3, n = 174, p = 0.175).

Glycaemic control of the child and parental diabetes knowledge

We found no linear relationship between the HbA1c values of children and the percentages of correct answers provided by caregivers. For caregiver 1, the Pearson correlation coefficient was r = 0.057 (95% CI: -0.097 to 0.208), with n = 165 and p = 0.470. Similarly, for the second caregiver, the correlation coefficient was r = -0.081 (95% CI: -0.266 to 0.110), with n = 108 and p = 0.406. Additionally, the combined responses from both caregivers showed no significant positive correlation with the glycaemic control of the children (Figure 5).

The glycaemic control deteriorated as the child grew and when the time from diagnosis increased (Table 3). However, the interaction of greater parental diabetes knowledge together with insulin pump treatment was associated with better T1D control.

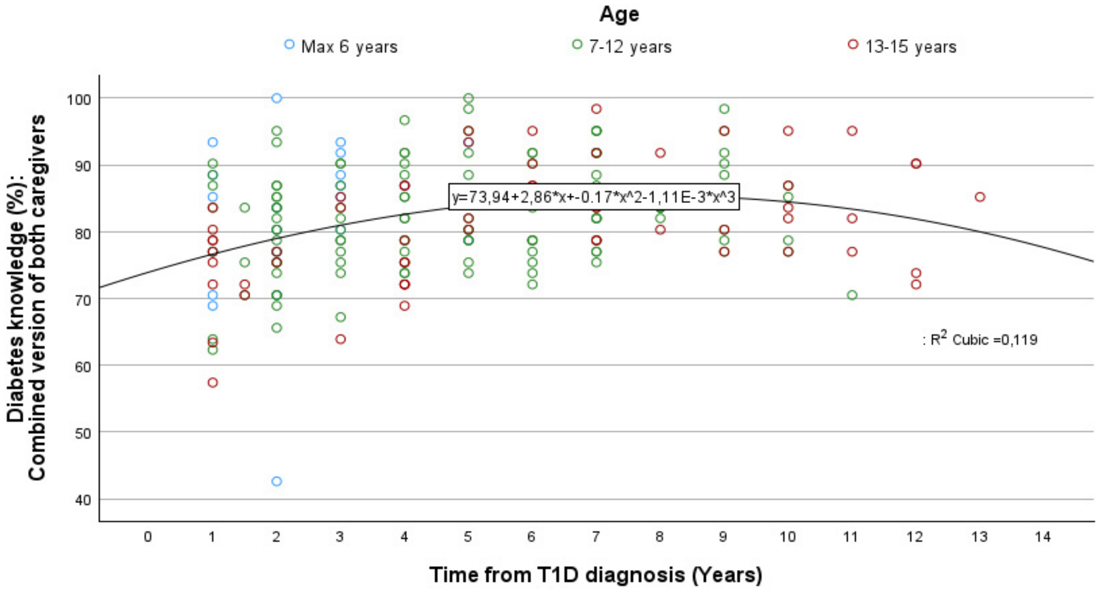

Figure 3. The caregivers' diabetes knowledge seemed to improve with the duration of the disease of the child up to 6 years but then started to decline.

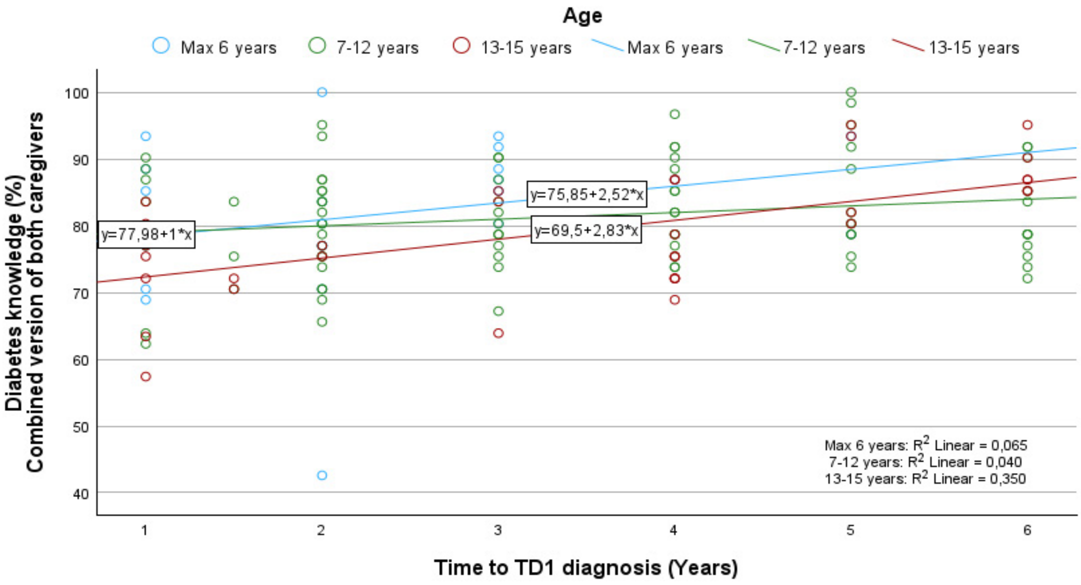

Figure 4. The linear increase in caregiver diabetes knowledge was observed across all age groups during the first 6 years after diagnosis.

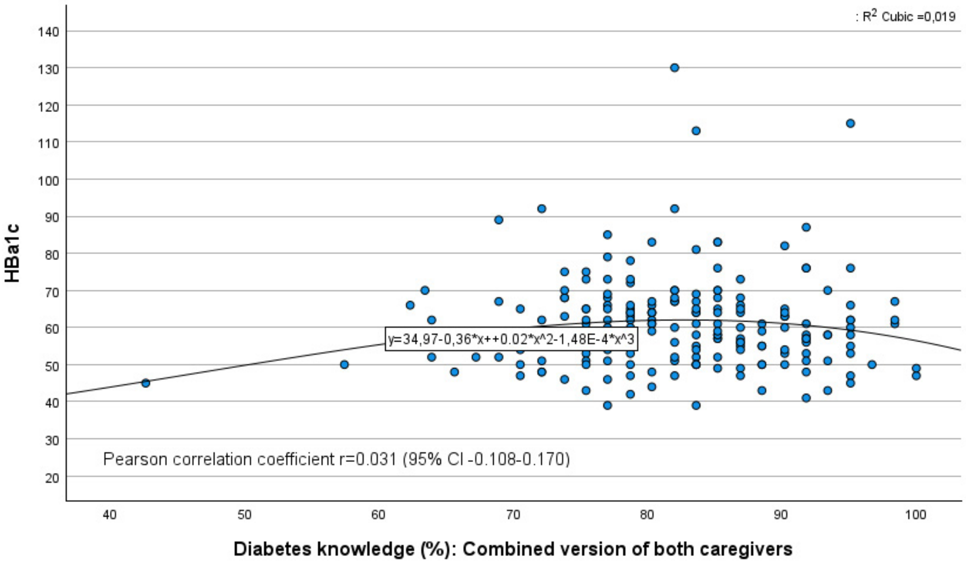

Figure 5. The combined responses from both caregivers showed no significant positive correlation with the glycaemic control of the children.

Table 3. Univariable and multivariable-adjusted factors associated with optimal glycated haemoglobin (HbA1c < 53 mmol/mol) and with poor metabolic control (HbA1c ≥ 75 mmol/mol).

		HbA1c < 53 mmol/mol						**HbA1c ≥ 75 mmol/mol**					
				Univariable		**Multivariable**				**Univariable**		**Multivariable**	
	N	**n**	**(%)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**n**	**(%)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Children													
Age of child, years as continuous	199	49	(25)	0.89	(0.79–0.99)*	0.91	(0.80–1.04)	21	(11)	1.92	(1.40–2.64)**	1.82	(1.29–2.56)**
Time from diagnosis, continuous normalised	199	49	(25)	0.37	(0.23–0.59)**	0.40	(0.22–0.73)*	21	(11)	6.33	(2.24–17.8)**	3.12	(1.11–8.75)*
Insulin delivery method													
Multiple-dose injections or a three-times daily insulin regimen (n=1)	92	30	(33)	1.00		1.00		9	(10)	1.00		1.00	
Insulin pump	107	19	(18)	0.45	(0.23–0.86)*	<0.001	(<0.001–0.008)*	12	(11)	1.17	(0.47–2.90)	0.79	(0.25–2.51)
Caregiver													
T1D knowledge, continuous	199	49	(25)	0.98	(0.94–1.02)	0.94	(0.89–0.997)*	21	(11)	1.02	(0.96–1.07)	1.00	(0.93–1.08)
The highest parental educational level university													
No	128	23	(18)	1.00		1.00		16	(13)	1.00		1.00	
Yes	63	24	(38)	2.81	(1.42–5.54)*	3.43	(1.58–7.45)*	3	(5)	0.35	(0.10–1.25)	0.33	(0.08–1.31)
Unknown	8	2	(25)	1.52	(0.29–8.03)	2.52	(0.42–15.1)	2	(25)	2.33	(0.43–12.6)	1.36	(0.15–12.3)
At least one parent has T1D													
No	174	45	(26)	1.00		1.00		17	(10)	1.00		1.00	
Yes	25	4	(16)	0.55	(0.18–1.68)	0.78	(0.22–2.73)	4	(16)	1.76	(0.54–5.73)	1.82	(0.40–8.24)
Statistically significant interactions													
Increasing T1D knowledge*Insulin pump						1.16	(1.06–1.27)*						

** p<0.001, * p<0.05. All pairwise interactions were tested, and statistically significant p<0.05 interactions were included in the multivariable-adjusted model. Logistic regression analysis was performed, and results were shown using odds ratios (OR) with 95% confidence intervals (CI).
T1D = type 1 diabetes, HbA1c = glycosylated haemoglobin, n = number of patients, OR = odds ratio, CI = confidence interval

Discussion

In the early years following diagnosis, parents are usually responsible for their child's therapy and glycaemic control. Structured education covering both the medical and psychosocial aspects of diabetes and its treatment, provided by a multidisciplinary paediatric diabetes team, is essential for developing adequate treatment skills and supporting families in achieving and maintaining optimal glycaemic control.

We did not find a correlation between parental diabetes knowledge and glycaemic control of the child, which is consistent with findings by Stefanowicz, et al. [14]. However, other studies have reported that greater parental knowledge is associated with lower HbA1c [15–18]. Given the relatively high level of diabetes knowledge among parents in our study population, reflected by their higher average scores compared to health care personnel not daily involved in diabetes care, further improvement in knowledge may not significantly impact the metabolic control of the children. The metabolic control of the child may depend more on other factors such as parent-child relationship, balance of parental involvement and acceptance of the disease [19].

In our cohort, only insulin pump users appeared to benefit from higher diabetes knowledge of the parents. This may be owing to retraining in diabetes skills or increased motivation for diabetes care at the time of switching to pump treatment. After several years of managing T1D within the family, caregivers' daily diabetes care may have become a routine without motivation to acquire further knowledge. At this stage, switching to a different insulin delivery modality may improve both caregiver knowledge and motivation, potentially leading to better metabolic control of their child. The use of hybrid closed-loop insulin pump systems has already changed the standard of diabetes knowledge needed in daily diabetes care. In the future, as fully closed-loop insulin pumps become available, achieving glycaemic control may depend even less on the user's knowledge and depend more on other factors such as acceptance of the disease as well as trust in the device.

In our study, we found a significant association between higher parental educational levels and better knowledge of diabetes among caregivers. However, previous studies have reported conflicting results regarding the influence of parental academic background on their understanding of diabetes and treatment proficiency [15,16,20,21]. Differences in parental educational level should likely be considered more carefully by diabetes care teams when designing and delivering family education.

There was a positive correlation between the test scores of the two caregivers within the same family. However, the primary caregivers who were mothers in our study had slightly better knowledge of diabetes, probably reflecting their greater responsibility for the daily care of the child with diabetes. This finding aligns with previous studies [15,18,22]. In clinical practice, mothers tend to attend outpatient visits more frequently than fathers, thereby receiving more training in diabetes management skills. Additionally, mothers may be more likely to seek out additional information on diabetes care through social media or the internet.

As parents are responsible for, or at least play a major role in the daily treatment of their child's diabetes during the early years after diagnosis, it was reassuring to observe that parents' diabetes knowledge improved over time. The downward trend in parental knowledge after the child has had the disease for > 9–10 years may be related to the increased responsibility of older children and adolescents for managing their own diabetes as well as the reduced involvement of parents in daily treatment decisions. However, it is unlikely that the often-deteriorating glycaemic control observed during adolescence could be significantly improved by increasing their parents' knowledge of diabetes. This is likely influenced more by psychosocial and family-related factors [23,24].

In the present study, the caregiver's own diabetes did not improve either the metabolic control of the child or the diabetes knowledge of the parent. Owing to the small number of caregivers with diabetes, these findings did not reach statistical significance. This aligns with earlier studies demonstrating that a family history of diabetes does not necessarily improve the metabolic control of a child with T1D [25–28]. However, the level of diabetes competency of caregivers was not assessed in those studies. Therefore, our study provides new and valuable insights into the diabetes knowledge of caregivers with T1D. Outdated care practices, higher glycaemic targets, or a heightened fear of hypoglycaemia among caregivers with T1D may partly explain the poorer diabetes management in their children. Emphasizing the importance of modern, tighter glycaemic targets [5,6] at the time of a child's diagnosis is essential, particularly when a parent has T1D, to prevent the transfer of outdated or incorrect practices and treatment goals into the child's diabetes care.

This study had certain limitations. First, a validated diabetes knowledge test specifically for Finnish paediatric patients with T1D and their caregivers is currently unavailable for evaluating knowledge of daily diabetes care. Most existing T1D knowledge instruments are outdated, few are designed for paediatric populations and none have been translated into Finnish [29–34]. In research contexts, the most widely used tool is the Revised Diabetes Knowledge Test, which targets general diabetes knowledge test for both T1D and T2D [34]. Among the instruments developed specifically for paediatric T1D, most focus primarily on nutrition or carbohydrate counting, or are too time-consuming to be feasible within the time constraints of outpatient visits [22,35,36].The M-WIKAD instrument, a shorter assessment designed for paediatric T1D, similarly focuses on general diabetes knowledge and does not cover topics such as diabetes technology [29]. The recent validation of the KAT-1 paediatric T1D knowledge test [37] represents a valuable advancement, but the instrument contains questions that limit its feasibility for clinical use, including items specific to US healthcare systems (e.g., insurance) and differences in units used. Additionally, it is available only in English. For this study, we developed a brief and practical knowledge assessment tailored to paediatric diabetes. Owing to limited validation, precise thresholds for excellent or poor performance on the test could not be established. However, pre-testing of the assessment with paediatric diabetes nurses and paediatric neurological nurses suggested that it functioned adequately. Second, the relatively limited sample size limited the statistical power of our analyses. For example, the number of participants with familial diabetes was small, so those findings should be interpreted with caution. Moreover, of the study sample lacked ethnic diversity. Evaluating the diabetes knowledge of caregivers from a broader range of cultural and linguistic backgrounds would be valuable, as their knowledge levels and, consequently, the glycaemic control of their children, may differ from those of Finnish-speaking parents.

Conclusion

Comprehensive diabetes education is essential for developing treatment competencies, fostering motivation and promoting family involvement in achieving treatment goals. In this study, once parents had attained a basic understanding of diabetes and its management, further increases in parental diabetes knowledge did not appear to enhance the metabolic control of their children, except among insulin pump users. Therefore, improving a child's glycaemic control may require approaches beyond strengthening parental diabetes education. These findings should be considered when prioritising healthcare resources aimed at improving diabetes management in children and adolescents to achieve optimal glycaemic control. Diabetes care teams should be aware that parental diabetes does not inherently improve a child's glycaemic control or enhance parental knowledge of diabetes care.

Data Availability

The data generated and analysed during the current study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare no potential conflict of interest.

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Author Contributions

CRediT

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