

**IOSUD – UNIVERSITATEA „DUNĂREA DE JOS” DIN GALAȚI**  
**DOCTORAL SCHOOL OF BIOMEDICAL SCIENCES**



**SUMMARY**

# **DOCTORAL DISSERTATION**

**PARTICULARITIES OF THE DOCTOR-PATIENT RELATIONSHIP IN CHILDREN WITH DIABETES**

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## **INTRODUCTION**

### **The Main Scientific Objective**

The objective of this work is to investigate the impact of a four-week individual ACT (Acceptance and Commitment Therapy) intervention on children and adolescents with type 1 diabetes in Romania, and how it succeeds in improving the flexibility of the doctor-patient relationship. Studies on paediatric diabetes and ACT are rare, but the published data on adults with diabetes are consistent with my findings, highlighting the role of the ACT intervention in improving the quality of life and mental health outcomes for patients with type 1 diabetes.

### **Research Method and Methodology**

From a research method perspective, I employed a mixed methodology, both quantitative and qualitative, which ensures statistical accuracy of the data as well as capturing the individual subjective experiences of the study participants. The intervention consisted of 4 ACT psychotherapeutic sessions, each approximately 50 minutes long, conducted individually, both in person and online. I used pre- and post-intervention measurement scales to test the outlined hypotheses. Additionally, narrative feedback helped corroborate the quantitative data from the questionnaires with the qualitative insights.

### **Practical Implications**

From a practical standpoint, the thesis offers a series of recommendations that can be immediately applied in practice to improve diabetes management in children and adolescents. Firstly, it emphasizes the need for continuous training of doctors in effective communication techniques and emotional support, essential aspects for building a strong doctor-patient relationship. Implementing ACT training programs for diabetologists and multidisciplinary teams could lead to improved clinical and psychological outcomes for patients. The thesis also highlights the importance of using modern technologies, such as online platforms, to provide psychological and educational support to patients in rural or isolated areas. These interventions can ensure equal access to quality care for all patients, regardless of their geographic location. The results also show that developing psychoeducational programs for patients and their families, which include sessions on diabetes management, stress reduction techniques, and coping strategies, can be useful in managing the disease.

## **GENERAL PART**

### **Chapter 1**

#### **DIABETES – PSYCHOSOCIAL CONSIDERATIONS IN ITS MANAGEMENT**

In 2024, the incidence and prevalence of diabetes in children and adolescents continue to be a significant public health issue.

Specific estimates for the incidence and prevalence of diabetes in children and adolescents in Romania for the year 2024 are not available. However, global and European data can provide a general idea of the observed trends, according to the latest data from the World Diabetes Association. Studies show that the incidence of type 1 diabetes varies between 0 and 330 cases per 100,000 people per year, and prevalence can range from 0 to 5,300 cases per 100,000 children and adolescents (ADAPPC, 2024). In Europe, there is an observed increase in the incidence of type 1 diabetes in children, and recent studies indicate a rising prevalence of type 2 diabetes, particularly among overweight and obese adolescents. This trend is also valid for Romania, where the increase in type 2 diabetes cases is associated with lifestyle-related risk factors and obesity (ADAPPC, 2024).

According to the largest European study to date (Reinauer et al., 2023), conducted on groups of adolescents with type 1 diabetes, there is a high prevalence (30.2%) of anxiety and depression symptoms among adolescents with type 1 diabetes. This cross-sectional observational study in Germany, conducted on 2,394 adolescents with type 1 diabetes (50.7% boys, average age 15.4 years) from 42 centers, was part of the multicenter COACH study (Chronic Conditions in Adolescents: Implementation and Evaluation of Patient-Centered Collaborative Care).

Adolescents with type 1 diabetes, who participated in regularly scheduled visits to diabetes clinics, were recruited from institutions participating in the national DPV registry (German Diabetes Prospective Follow-Up Registry).

The incidence and prevalence of anxiety and depression among people with type 1 diabetes are higher compared to the general population. According to the 2024 Standards of Diabetes Care from the American Diabetes Association (ADA), diabetic patients are more prone to mental disorders due to the ongoing stress related to managing the disease, blood sugar fluctuations, and the long-term complications associated with diabetes (ADAPPC, 2024). The ADA indicates that individuals with type 1 diabetes have a higher prevalence of depression

compared to the general population. Studies show that up to 30% of people with type 1 diabetes may experience symptoms of depression during their lifetime. The incidence of major depressive disorder in this group is approximately two to three times higher than in those without diabetes. Anxiety disorders are also more common in diabetic patients. The prevalence of generalized anxiety disorder (GAD) in individuals with type 1 diabetes is estimated at around 20%, which is significantly higher than the prevalence in the general population.

## **Chapter 2**

### **TYPE 1 DIABETES AND ACT PSYCHOTHERAPEUTIC INTERVENTION**

The general purpose of ACT (Acceptance and Commitment Therapy) is to increase psychological flexibility—the ability to fully engage with the present moment as a conscious human being—and to change or persist in behavior when it serves valuable purposes. Psychological flexibility is established through six core processes. Each of these areas is conceptualized as a positive psychological skill, not merely as a way to avoid psychopathology (Fletcher and Hayes, 2005).

ACT is based on the idea that language is at the core of many psychological disorders specifically, and human suffering in general (Hayes, Strosahl, & Wilson, 1999). ACT is a therapeutic approach designed to use language in a way that it becomes a tool for treatment. This approach is based on an increasingly extensive body of behavioral research on human language and cognition, known as Relational Frame Theory (RFT: Hayes, Barnes-Holmes, & Roche, 2001).

It is very important for pediatric patients and adolescents with diabetes not to identify with their pathology. Otherwise, they may either become absorbed by the disease or avoid acknowledging the fact that they have diabetes. Therefore, a psychotherapy session introducing the concept of the "contextual self" is very useful.

ACT has shown positive results for a wide variety of conditions, including chronic medical conditions, even when presented in a very brief form. For example, a 9-hour ACT intervention had a positive impact on epilepsy in the following year (Dahl, 2005).

The study on which I will base my research is from 2006, conducted by Steven C. Hayes from the University of Nevada and Jennifer A. Gregg and Glenn M. Callaghan from San Jose State University.

Patients from a low-income community with type 2 diabetes participated in a 1-day workshop

as part of their diabetes management program (Gregg et al., 2007). There were two groups: one that received only psychoeducation related to diabetes and an ACT intervention, and another that received only education on better diabetes management. Compared to those who received only diabetes education, after 3 months, those with the ACT intervention reported better self-care and HbA1C levels within normal parameters.

### **Chapter 3**

#### **THE DOCTOR-PATIENT RELATIONSHIP**

The first systematic review of the psychological evaluation of the doctor-patient relationship was published in 2012 by Eveleigh et al. In December 2009, the authors systematically searched for questionnaires that measure the doctor-patient relationship. Their inclusion criteria were as follows:

1. Article about a questionnaire or survey.
2. Questionnaire that measures the relationship between doctor and patient.
3. The relationship is the main theme of the questionnaire, not satisfaction or communication as the primary focus.

They searched four databases: PubMed, PsycINFO, EMBASE, and Web of Science, resulting in 19 instruments that evaluate different aspects of the doctor-patient relationship. The instruments found also vary in how they have been psychometrically tested. Out of the 19 instruments, eight focus on the psychological aspect, and four were developed in therapy.

PDRQ (Patient-Doctor Relationship Questionnaire) is the instrument used in the present studies. The PDRQ-9 was developed from Luborsky's Helping Alliance Questionnaire, a scale that measures the therapeutic alliance in psychotherapy. Its psychometric qualities and validity were evaluated in general practice, with the collaboration of 110 internists and 55 patients in an epilepsy clinic. Principal component analysis demonstrates a bifactorial structure, one related to the doctor and one related to the patient's medical symptoms.

## **PERSONAL PART**

### **Chapter 4**

#### **GENERAL RESEARCH METHODOLOGY**

This thesis includes three studies and has the following general objectives:

1. To investigate the efficiency of an ACT intervention in optimizing the doctor-patient relationship and emotional responses in adults with type 1 diabetes.
2. To investigate the efficiency of an ACT intervention in optimizing the doctor-patient relationship and emotional responses in children and adolescents with type 1 diabetes.

Therefore, the general hypotheses of the thesis were as follows:

H1 - An ACT intervention can facilitate the reduction of stress levels associated with the diagnosis of type 1 diabetes (in both adults and children).

H2 - An ACT intervention can contribute to increasing the level of acceptance of the diagnosis in patients with type 1 diabetes (in both adults and children).

H3 - An ACT intervention can help build a better doctor-patient relationship in individuals with type 1 diabetes (in both adults and children).

H4 - An ACT intervention can contribute to increasing the level of psychological flexibility in individuals with type 1 diabetes (in both adults and children).

#### **4.2. Design and Participants**

Aiming to capture the particularities of the doctor-patient relationship in patients with type 1 diabetes, this thesis explored these aspects in both adults (Ștefănescu et al., 2024a) and children (Ștefănescu et al., 2024b) to obtain a comprehensive picture of how the observed variables manifest at different ages. The inclusion criteria consisted of having a diagnosis of type 1 diabetes for more than one year, allowing the patient to have experienced post-diagnosis situations, while the exclusion criteria targeted the presence of a severe and persistent psychiatric diagnosis (such as schizophrenia), along with cognitive deficits.

#### **4.3. Instruments**

The instruments used to accurately measure the variables being studied were chosen based on the criterion of internal consistency, ensuring that all the applied instruments had a high level of internal consistency. Additionally, they were self-report instruments with Likert scale measurements, allowing for the capture of nuances and the current level of the measured construct.



#### **4.4. Intervention**

The intervention applied was structured into four ACT-based psychotherapy sessions, each lasting approximately 50 minutes, conducted in an individual format.

### **Chapter 5 – Study 1**

## **OPTIMIZING THE DOCTOR-PATIENT RELATIONSHIP AND EMOTIONAL RESPONSES IN ADULTS WITH TYPE 1 DIABETES – A PILOT STUDY**

### **5.1. Introduction**

The inclusion of a study on the doctor-patient relationship in adults with diabetes in a thesis that focuses on children and adolescents can be justified from several perspectives. Studies on adults provide a reference framework for comparison, highlighting similarities and differences in the needs and responses of different age groups.

### **Objectives, Hypotheses, and Study Variables for the Pilot Study**

#### **Specific Objectives:**

- O1. To measure the levels of psychological flexibility and diabetes acceptance before and after the intervention.
- O2. To measure the quality of the doctor-patient relationship before and after the intervention.
- O3. To measure the level of stress before and after the intervention.
- O4. To analyze the participants' narrative feedback regarding the impact of the intervention on them.

Based on the specific objectives of the study, the following hypotheses were formulated:

- H1. We assume that levels of psychological flexibility and diabetes acceptance will significantly increase post-intervention.
- H2. We expect that the doctor-patient relationship will improve following the intervention.
- H3. We expect that participants' stress levels will decrease post-intervention.
- H4. We expect that the analysis of participants' narrative feedback will reveal that the ACT sessions were perceived positively by the participants.

#### **Study Variables**

The main variables of the study are those measured quantitatively on a Likert scale (psychological flexibility, diabetes acceptance, doctor-patient relationship, and stress level). We expect these to vary depending on the impact of the ACT intervention variable.

## **5.2. Material and Method**

### **Participants and Design**

The study was conducted on a group of thirteen adults diagnosed with type 1 diabetes, who were informed about the research procedure and provided written consent to participate.

This group included ten female and three male participants, with an average age of 39.04 years (age SD = 13.47), ranging from 18 to 59 years.

### **Instruments**

#### **Stress, Anxiety, and Depression Scale (DASS-21R)**

To measure stress levels, the Stress, Anxiety, and Depression Scale (DASS-21R) (Lovibond & Lovibond, 1995) was applied. This is a self-report scale consisting of 21 items, with good internal consistency ( $\alpha = 0.88$ ). For the purpose of this study, only the Stress Scale was applied, using the Romanian-adapted version (Petre & Miclea, 2011). An example of an item included in this scale is: "I found it hard to relax."

#### **Acceptance and Commitment Diabetes Questionnaire (AADQ)**

The Acceptance and Commitment Diabetes Questionnaire (AADQ; Gregg et al., 2007) was applied to capture the level of diabetes acceptance. With a good internal consistency index ( $\alpha = 0.91$ ), it contains six items that refer to engagement in various non-acceptance behaviors related to diabetes (e.g., "I try to avoid reminders about my diabetes," "I avoid thinking about what diabetes can do to me"). For this study, the AADQ was translated from English into Romanian.

#### **Patient-Doctor Relationship Questionnaire (PDRQ-9)**

The doctor-patient relationship was measured using the Patient-Doctor Relationship Questionnaire (PDRQ-9, Van der Feltz-Cornelis et al., 2004), a scale that includes 9 items about the quality of the doctor-patient relationship and has strong internal consistency ( $\alpha = 0.94$ ). Its items are formulated as various statements related to the doctor's dedication, accessibility, understanding, trust, or usefulness. For application, the questionnaire was translated into Romanian, with an example item being: "My doctor understands me."

#### **Multidimensional Psychological Flexibility Inventory (MPFI)**

The Multidimensional Psychological Flexibility Inventory (MPFI, Rolffs et al., 2016) was used to examine psychological flexibility, having high internal consistency ( $\alpha = .96$ ). It includes 60 statements related to engagement in behaviors that denote psychological flexibility.

An example item is, "I have been open to noticing unpleasant thoughts and feelings without interfering with them."

### **Intervention**

Participants underwent an ACT-based psychotherapeutic intervention, structured into four individual sessions of approximately 45 minutes each, conducted online via the Zoom platform (this format was chosen in accordance with the hospital's-imposed restrictions). These sessions were led by a specialized clinical psychologist.

### **Procedure**

Participant recruitment took place through Romanian online groups dedicated to diabetes and social media platforms, from December 2022 to August 2023. Before giving their consent to participate, participants were informed about the research purpose, the duration and structure of the intervention, as well as their right to withdraw at any time and the assurance of personal data protection and anonymity. Written consent was required for participation. Regarding the confidentiality of the collected personal information, it was anonymized (coded) and stored in secure files accessible only to the research team. Participation was voluntary, no incentives were offered, and the intervention was free of charge. Approval for the research protocol was obtained from the Ethics Committee of the "St. Andrew the Apostle" Clinical Emergency County Hospital, Galați (approval no. 16275, 27.07.2023).

## **5.3. Results**

### **Feasibility**

Although 47 adults initially completed the assessments, 10 individuals did not attend the first session (due to reasons such as time constraints or difficulties installing the Zoom platform), and 24 participants who engaged in all four online sessions did not complete the post-intervention assessments (due to time constraints, being on vacation, or lacking internet access). See Table 5.1 and Table 5.2.

### **Demographic data**

Table 5.1. Level of studies (N=24)

	Highschool studies or less	University studies	Post university studies
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Number of participants	13	11	4
Participants percentage	44.7%	41.3%	14%

## Descriptive Statistics

Descriptive data (mean, standard deviation, skewness, and kurtosis indicators) regarding the participants' scores can be found in detail in Table 5.3 and Table 5.4. As observed, the distribution of psychological inflexibility showed a significant deviation from normality in the post-intervention phase. The significance of this result will be discussed in the dedicated discussion section.

Table 5.3. Means and Standard Deviations of Measured Variables Before and After the Intervention

	Stress - Pre	Stress - Post	Flexibility - Pre	Flexibility - Post	Inflexibility Pre	Inflexibility - Post	Acceptance - Pre	Acceptance - Post	PDR - Pre	PDR - Post
Medie	30.46	11.85	3.08	4.8	3.58	2.70	17.77	8.54	32.92	35.08
SD	9.80	9.43	.59	.93	.82	.84	5.1	3.12	7.92	10.91

Note: PDR = Patient-Doctor Relationship; SD = Standard Deviation.

Table 5.4. Skewness and Kurtosis Values of Measured Variables Before and After the Intervention

	Stress - Pre	Stress - Post	Flexibility - Pre	Flexibility - Post	Inflexibility Pre	Inflexibility Post	Acceptance - Pre	Acceptance - Post	PDR - Pre	PDR - Post
Skewness	-.18	.57	-.87	-.5	.01	1.21	-.34	1.28	-.23	-1.45
Kurtosis	-1.4	-.52	-.05	-1.01	-1.14	2.11	-1.01	1.18	-.83	1.78

Note: PDR = Patient-Doctor Relationship

Table 5.5. Pre- and Post-ACT Intervention Differences for Adults with Type 1 Diabetes

Variable	Wilcoxon Test-W	P	Mean Differences Pre- and Post-Intervention	Effect size (r)
Stress	86	.005	18	.89
Diabetes Acceptance	78	.002	10	.99
PDR	13.50	.168	-5	-.50
Flexibility	3.50	.004	-1.70	-.92
Inflexibility	80	.013	.86	.75

Note: PDR = Patient-Doctor Relationship

## 5.5. Conclusions

In the process of managing diabetes, a brief intervention using Acceptance and Commitment Therapy (ACT) can significantly reduce the stress levels associated with the disease, significantly improve psychological flexibility, and enhance acceptance of the diagnosis—psychological factors with transdiagnostic and protective roles against stress.

At the same time, the intervention did not produce notable changes in the patient-doctor relationship, possibly due to the complex psychosocial elements underlying this connection. Narrative feedback supported these findings, revealing participant satisfaction with the intervention and an improvement in quality of life. To clarify these preliminary results, future studies could consider the recommendations that emerged from this format.

## Chapter 6 – Study 2 OPTIMIZING THE DOCTOR-PATIENT RELATIONSHIP AND EMOTIONAL RESPONSES IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES

### 6.1. Introduction

Regarding the effectiveness of ACT (Acceptance and Commitment Therapy) for children without diabetes, the most recent meta-analysis (Fang & Ding, 2020) on ACT interventions for children, which included 14 randomized controlled trials with 1,189 participants, found that ACT significantly improves symptoms of anxiety and depression.

The most recent study from 2024 (Alho & Lappalainen, 2024) involved adolescents diagnosed with type 1 diabetes who participated in a series of group sessions based on ACT principles. These sessions aimed to help them cope with the psychological challenges associated with managing their chronic condition. The study found high levels of acceptability among the participants.

**6.2. Materials and Methods** Based on the promising results obtained in the first study presented in this thesis (Ștefănescu et al., 2024), which supports the effectiveness of ACT interventions in managing type 1 diabetes in adults, as well as the literature that attests to the association of these interventions with better outcomes in other chronic diseases, such as fibromyalgia or chronic pain (Wicksell et al., 2013; Alho et al., 2022, 2024), it is important to explore the benefits and applicability of ACT therapy in different niches and populations.

This study had the following specific objectives:

- **O1:** Measure stress levels before and after the intervention in children and adolescents.
- **O2:** Measure the quality of the doctor-patient relationship before and after the intervention in children and adolescents.
- **O3:** Measure psychological flexibility and diabetes acceptance before and after the intervention in children and adolescents.
- **O4:** Analyse verbal feedback provided by participants following the intervention.

Based on these specific objectives, the following hypotheses were developed:

- **H1:** We expect the participants' stress levels to decrease significantly after the intervention.
- **H2:** We expect the quality of the doctor-patient relationship to improve following the intervention.
- **H3:** We expect levels of psychological flexibility and diabetes acceptance to increase following the intervention.

**Participants and Design** Fifty-five children and adolescents from Romania (mean age = 14.14, SD = 2.26; 33% boys and 67% girls) participated in this single-arm study, which focused on evaluating a specific ACT intervention on the management of paediatric type 1 diabetes. The ages of the participants ranged from 10 to 18 years. Recruitment was done through two

strategies: from patients hospitalized at the St. John Emergency Clinical Hospital for Children in Galați and from members of online diabetes support groups after posting an invitation to participate. Although 57 participants initially expressed interest in the study, two dropped out before completion, resulting in a dropout rate of approximately 3.5%.

**Instruments** The following instruments were used to measure each variable included in the study:

- **Perceived Stress Scale - Child Version:** Stress was measured using the Perceived Stress Scale - Child Version (White, 2014). With an internal consistency of 0.77, this scale is well-established in the field for assessing the intensity of perceived stress in children. The scale contains 14 questions, with responses providing a general stress score. Examples of items include statements like "I can handle bad thoughts about myself" and "It's easy for me to focus on what I'm doing, even if I feel sad."
- **Psychological Flexibility Questionnaire for Children:** Psychological flexibility was measured using the Psychological Flexibility Questionnaire for Children (Lenoir et al., 2022). This instrument includes 24 items that reflect the frequency or degree to which each exemplified situation applies. Items include statements like "I can handle bad thoughts about myself" and "It's easy for me to focus on what I'm doing, even if I feel sad." The questionnaire demonstrated high internal consistency, with an alpha index value of 0.78. The total score for flexibility is obtained by summing the item responses, resulting in a total scale score, as well as separate scores for each subscale.
- **Diabetes Acceptance and Action Questionnaire:** Diabetes acceptance was measured using the Diabetes Acceptance and Action Questionnaire (AADQ; Gregg et al., 2007). This questionnaire contains 6 items that reflect the degree of non-acceptance of diabetes-related experiences. Examples of items include "I try to avoid thoughts and feelings related to diabetes" and "I am able to manage my diabetes even when I feel stressed." The questionnaire also has high internal consistency, with a Cronbach's alpha coefficient of 0.95. Scores are calculated by summing the item responses, with lower scores indicating higher levels of acceptance.
- **Patient-Doctor Relationship Questionnaire:** The doctor-patient relationship was measured using the Patient-Doctor Relationship Questionnaire (PDRQ; van der Felz-Cornelis et al., 2004). This questionnaire is administered to the patient and contains 9 items that indicate how frequently certain behaviors are observed by the patient in their

doctor. Such behaviors are expressed in statements like "My doctor gives me attention" and "My doctor makes me feel comfortable." The PDRQ-9 does not include other subscales and evaluates the overall patient-doctor relationship. The questionnaire also has very high internal consistency, with a Cronbach's alpha coefficient of 0.94. Scores are obtained by summing the responses to the 9 items, resulting in a total score between 9 and 45.

**Procedure** Participants in this study were selected between December 2022 and December 2023 through various available online channels, including diabetes support groups in Romania, social media platforms, and direct referrals from the medical staff of the St. John Emergency Clinical Hospital for Children in Galati, Romania. The study adhered to rigorous ethical standards and was approved by the Ethics Committee of the St. John Children's Hospital in Galati, Romania, according to approval no. 35792/29.12.2022.

### **Intervention**

The intervention targeted in this study was based on the specific approach of Acceptance and Commitment Therapy (ACT), following recommendations from the literature regarding its application with children (Black, 2022). It was implemented over a period of 4 weeks, in an individual format, both face-to-face and online, depending on preferences and conditions. Each of the 4 sessions was held one week apart and lasted around 50 minutes. The intervention was delivered by a licensed clinical psychologist.

### **Results**

#### **Descriptive Statistics on Participants**

After applying the selection criteria, data from 55 participants were analyzed, as 2 of the 57 children withdrew before the intervention began. The average age of the study participants was 14 years (with a standard deviation of 2.26 years), and 67% of the participants were girls (Table 6.1). Of these, participants who were hospitalized at the time of the intervention participated in person at the Sf. Ioan County Emergency Hospital in Galați, while the rest opted for the online format, with most of them living in other parts of the country (Table 6.2).



Table 6.1. Demographic Data of Children and Adolescents with Type 1 Diabetes Participating in the Study

	Average Age	Gender		Residence	
		Female	Male	Rural	Urban
Participants Number	14 years	85 (67%)	42 (33%)	7 (5%)	120 (95%)

Table 6.2. ACT Intervention Format for Children and Adolescents

	Intervention Format	
	Physical	Online
Percentage	33%	77%

Additional details about the hospitalized patients at the Sf. Ioan Emergency Children's Hospital in Galați, including those participating in the study, reported 75 medical cases at the time of the study. These cases did not require surgical interventions and did not present life-threatening complications. Additionally, 78% of these cases were admitted on an emergency basis, suggesting the primary reasons for their presentation to the doctor and, implicitly, the conditions under which the doctor-patient relationship is formed (and its importance). Furthermore, 18% of the cases came from towns in other counties (reflecting the lack of availability of necessary medical services in their home counties), and 52% of the total number of patients reported coming from rural areas (for more information related to the specifics of hospitalization, see Table 6.3). Moreover, the maximum duration of hospitalization was 24 days, and the most common comorbidities fell under the category of endocrine, nutritional, and metabolic disorders (83%), with only one case of psychiatric comorbidity.

Table 6.3. Hospitalization Data at the Sf. Ioan Emergency Children's Hospital in Galați from December 2022 to August 2023

	N	% percentage
Total cases	75	100%

Medical Cases	75	100%
Surgical Cases	0	0%
Emergency Admissions	59	78%
From other towns	14	18%
From rural areas	40	52%
Minimum hospitalisation days (N)	1	-
Maximum hospitalisation days (N)	24	-
Main discharge diagnosis		
Type 1 Diabetes without complications	35	45%
Type 1 Diabetes with poor control	11	14%
Type 1 Diabetes with ketoacidosis, without coma	10	13%
Comorbidities		
Endocrine, nutritional, and metabolic disorders	64	83%
Blood disorders	5	6.5%
Nervous system disorders	1	1.3%

*Note:* Data were obtained for 75 hospitalised patients.

### **Means and Standard Deviations of Measured Variables**

Following the analysis of the means of the variables before and after the intervention, the following was observed: before the intervention, the variable with the highest value was flexibility, with a mean of 46.05 (SD = 14.75), followed by stress, with a mean of 36.27 (SD = 7.80), acceptance, with a mean of 24.35 (SD = 7.93), and patient-doctor relationship (PDR), with a mean of 18.96 (SD = 6.01). See Table 6.4.

After the intervention, flexibility remained the variable with the highest mean value, increasing to 56.07 (SD = 13.07), followed by PDR, which showed a significant increase to 33.02 (SD = 5.74), stress, which decreased to 25.91 (SD = 10.34), and acceptance, which significantly decreased to 8.53 (SD = 4.39). These changes indicate an improvement in flexibility and the patient-doctor relationship, along with a reduction in stress levels and acceptance after the intervention.

Table 6.4. Means and Standard Deviations of Measured Variables Before and After the Intervention

	Stres - Pre	Stres - Post	Flexibility - Pre	Flexibility - Post	Ac- ceptance- Pre	Accept- ance- Post	PDR - Pre	PDR - Post
Mean	36.27	25.91	46.05	56.07	24.35	8.53	18.96	33.02
SD	(7.80)	(10.34)	(14.75)	(13.07)	(7.93)	(4.39)	(6.01)	(5.74)

Note: SD= standard deviation; PDR= patient doctor relationship.

### Correlations Between Study Variables

The analysis of correlations before and after the intervention highlights some notable aspects (see Table 6.5). In the pre-intervention period, a very high and significant correlation was observed between stress and diabetes acceptance ( $r = 0.75$ ,  $p < 0.01$ ), as well as between stress and PDR ( $r = -0.73$ ,  $p < 0.01$ ). These correlations indicate that a higher level of stress is associated with lower acceptance of diabetes and a lower quality patient-doctor relationship.

After the intervention, the correlation between stress and diabetes acceptance decreased ( $r = 0.18$ ), and the correlation between stress and PDR became less negative ( $r = -0.18$ ). Additionally, a moderate and significant correlation was observed between acceptance and PDR ( $r = -0.27$ ,  $p < 0.05$ ), suggesting that diabetes acceptance improved, and the patient-doctor relationship remained an important factor in how patients perceive their acceptance of the disease.

Table 6.5. Pre and Post-Intervention Correlation Analysis

	Stress – Pre	Stress- Post	Flexibility– Pre	Flexibility – Post	Ac- ceptance - Pre	Ac- ceptance– Post	PDR – Pre	PDR - Post
Stress	-	-						
Flexibility	0.03	0.08	-	-				
Acceptance	0.75**	0.18	0.06	-0.10	-	-		
PDR	-0.73**	-0.18	-0.07	-0.18	-0.75	-0.27*	-	-

Note: \* $p < 0.05$ , \*\* $p < 0.01$ .

### Skewness and Kurtosis Indicators

The analysis of skewness and kurtosis indicators (Table 6.6) reveals significant changes in the distribution of variables before and after the intervention. In the pre-intervention period, most variables show slight negative skewness, except for the patient-doctor relationship (PDR), which has moderate positive skewness (0.72).

Table 6.6. Skewness and Kurtosis Values of Measured Variables Before and After the Intervention

	Stress - Pre	Stress- Post	Flexibility- Pre	Flexibility - Post	Ac- ceptance- Pre	Ac- ceptance - Post	PDR - Pre	PDR - Post
Skewness	-0.15	0.60	-0.19	0.22	-1.09	1.81	0.72	-2.38
Kurtosis	-0.78	-0.77	0.64	0.16	-0.36	2.28	-0.72	6.44

Note: PDR= doctor patient relationship.

Moreover, following the analysis of these indicators and considering the non-compliance with the values of a normal distribution, the decision was made to apply the non-parametric Wilcoxon test pre- and post-intervention, in the case of diabetes acceptance and the doctor-patient relationship.

**H4.** We expect that the verbal feedback from the participants will highlight how the intervention was helpful.

The main variables of the study were measured quantitatively on a Likert scale (stress, doctor-patient relationship, psychological flexibility, diabetes acceptance) in a self-report format.

### Intervention Effect

#### The t-test for dependent samples

As indicated by the differences in the pre- and post-intervention means, after applying the t-test for dependent samples, it was shown that the ACT intervention was associated with a decrease in stress levels ( $t(54) = 8.75, p < .001, d = 1.18$ ) as well as an increase in psychological flexibility ( $t(54) = -4.00, p < .001, d = -.54$ ), proving to be effective in these two aspects.

More specifically, the effect on stress was very large, and the effect on psychological flexibility was large (see Table 6.7). It is also worth noting the confidence interval level and the p-value for stress, with a confidence interval set at 95%, with values ranging between 0.83 and 1.52, at a  $p < 0.001$ . Thus, there is a 95% chance that the true value of the result lies within this interval. Similarly, the 95% confidence interval for psychological flexibility had values between -0.82 and -0.25, with a  $p < 0.001$ .

Table 6.7. Pre- and post-intervention differences in stress and psychological flexibility

Variables	95% Confidence Interval		t (54)	p	Effect Size (Cohen's d)
	Lower Limit	Upper Limit			
Stress	0.83	1.52	8.75	< 0.001	1.18
Psychological Flexibility	-0.82	-0.25	-4.00	< 0.001	-0.54

### Wilcoxon Test

The results of the Wilcoxon test revealed that both variables underwent significant changes following the intervention (see Table 6.8). More specifically, in the case of diabetes acceptance, this significant change is indicated by the Wilcoxon index value ( $Z = 1417.5$ ), reflecting a significant difference between the levels of diabetes acceptance before and after the intervention, a difference found to have a large effect size, as shown by the effect size index ( $r = 0.98$ ), at a  $p < 0.001$ , with an average difference of 15.8 points between pre- and post-intervention values.

Similarly, in the case of the doctor-patient relationship, the Wilcoxon index showed a significant difference following the intervention ( $Z = 89.5$ ), with a  $p < 0.001$ , and an average difference of -15.5 points between pre- and post-intervention values. Furthermore, the effect size index indicated that this difference was substantial ( $r = -0.86$ ). The negative value of the effect size indicates a decrease in behaviors reflecting a poor doctor-patient relationship, thus actually expressing an improvement in the doctor-patient relationship after the intervention.

Table 6.8. Pre- and post-intervention differences in diabetes acceptance and the doctor-patient relationship

Variabiles	Wilcoxon Test - W	P	Mean Differences Pre- and Post-Intervention	Effect Size (r)
Diabetes Acceptance	1417.5	< 0.001	15.8	0.98
PDR	89.5	< 0.001	-15.5	-0.86

## 6.4 Discussions

The doctor-patient relationship remains an aspect that has not yet been fully explored in all its forms. Specifically, in the case of children with diabetes, there are few quantitative studies that address this aspect (Brown and Venetis, 2023; Croom et al., 2010; Okeke and Morgan, 2023), and in the field of ACT interventions, such studies are completely absent. Continuous education in self-management of diabetes and support is essential for preventing acute diseases, avoiding complications, and reducing the risk of long-term complications. Type 1 diabetes is one of the most common chronic conditions in children worldwide, with an increasing incidence of diabetes cases in adolescents over the past decades (Patterson et al., 2019). Managing diabetes is extremely demanding (Cameron et al., 2018), as it is a complex metabolic disorder that requires frequent blood glucose monitoring, medication administration, balancing insulin needs, adhering to dietary guidelines, and managing episodes of hypoglycemia or hyperglycemia. Adolescence represents a risky period for diabetes management due to deteriorating metabolic control, partly due to insulin resistance during puberty and partly due to reduced adherence to the diabetes regimen.

## 6.5 Conclusions

Consequently, these results align with studies that attest to the effectiveness of ACT in reducing stress and increasing psychological flexibility in children (Wicksell et al., 2013; Compas et al., 2017; Alho et al., 2022, 2024), while also providing additional data on its effects on improving the relationship between the treating doctor and the patient. Furthermore, it validates and extends the most recent findings in the literature regarding the effect of ACT on pediatric diabetes. This refers to the study by Alho and Lappalainen (2024), which demonstrated the effectiveness of a group ACT intervention in managing the challenges faced by adolescents with diabetes. Here, the organized ACT sessions were held in a group format, with physical meetings aimed at helping them cope with the psychological challenges associated with managing their chronic condition. Following the intervention, an increase in acceptance skills was observed among

participants, and the adolescents reported that the ACT sessions were useful and relevant to their needs, indicating a positive perception of the intervention and its utility. Additionally, participants recorded improvements in psychological flexibility, a core component of ACT. This was associated with better stress management related to diabetes and increased engagement in value-based actions, despite the challenges posed by their condition. It was also found that implementing ACT in a group setting is feasible and cost-effective, reaching a larger number of patients in a short period, with the group format providing additional support in building a therapeutic relationship and fostering a peer-to-peer rapport. Therefore, the results obtained, along with this recent study, suggest that ACT can be a valuable therapeutic approach for adolescents and children with type 1 diabetes, offering them tools to better manage the emotional and psychological aspects of their disease. This could lead to improved overall well-being and better diabetes management. Moreover, these data (from our study and the one described above), when taken together, confirm that both formats in which ACT interventions were delivered (individual and group) are equally effective in managing stress and increasing psychological flexibility. Data obtained from a medical study in which I, the author of this doctoral thesis, participated equally (Pelin et al., 2022), support this very idea, highlighting the link between blood glucose levels and obesity.

## **Chapter 7: THE IMPORTANCE OF COMMUNICATION AND EMPATHY IN THE DOCTOR-PATIENT RELATIONSHIP FOR CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES - A META-ANALYSIS – Study 3**

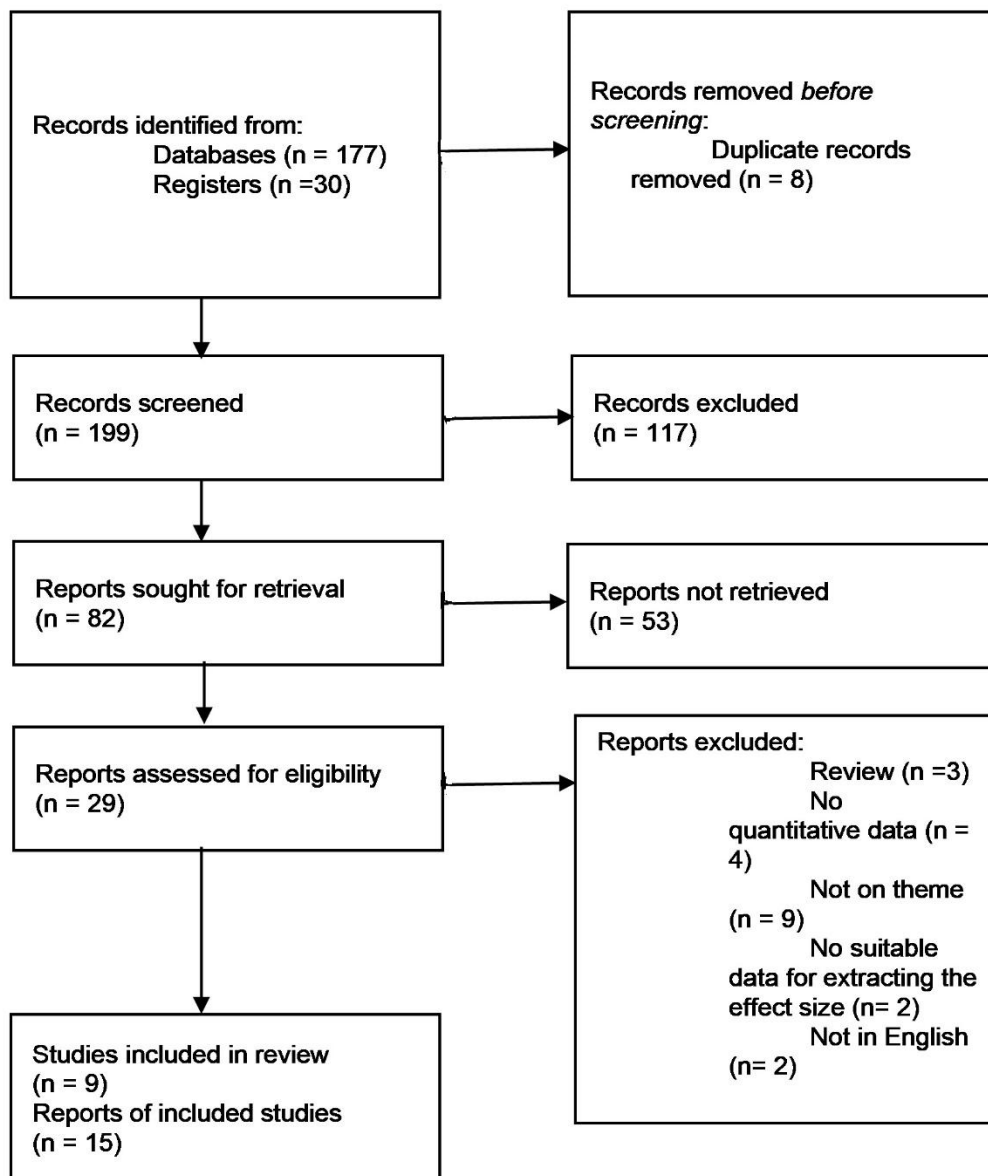
**7.1. Introduction** Most of the studies analysed in this research were conducted on children and adolescents with Type 1 diabetes, not from the perspective of the doctors treating these patients. Therefore, the study is focused on their perspective. The search revealed divergent results.

**7.2. Material and Method** Given the divergent results in the literature regarding the effect of a good doctor-patient relationship on the treatment outcomes of patients with Type 1 diabetes, the main objective of this study is to clarify this by investigating the particularities of this relationship in the treatment of Type 1 diabetes patients.

**Identification and Selection of Specialized Studies** Potentially relevant studies were searched in major databases (PubMed, Science Direct, PsychInfo, Web of Science, Proquest, Google Scholar, MedLine) from June 3 to June 29, 2024. Additional studies included in pre-

vious meta-analyses in the field (e.g., Datye et al., 2015; van Dam et al., 2002) were also extracted. The following search string was used to search the literature: (patient-doctor relationship OR patient-physician relationship OR patient-provider relationship OR patient adherence to the treatment) AND type 1 diabetes acceptance of the diagnosis AND treatment adherence AND children OR adolescen\* OR teenagers OR youth. **Study Selection and Inclusion** In the end, 10 studies were included in the meta-analysis.

Fig. 7.1. PRISMA Flow chart: identification and the selection of the studies



**Extracted Moderators** The categorical moderators were as follows:



- **Elements constituting the doctor-patient relationship**, comprising six categories: clinician's objectives (1 study), communication (5 studies), partnership (2 studies), respect for the patient and doctor's agreeableness (2 studies), patient satisfaction with the relationship (2 studies), telecommunication (3 studies). Considering the differences between face-to-face communication and communication via various devices, the two were analysed under distinct subcategories to better observe the extent to which these differences yield different results.
- **Types of outcomes analysed**, namely diabetes management (1 study), glycaemic control (9 studies), and treatment adherence (5 studies), which are the most common indicators of treatment progress in diabetes cases.
- **Time since diagnosis**, with two categories: less than 5 years (4 studies) and more than 5 years (10 studies).
- **Method of relationship evaluation**: evaluator (3 studies), reporting (either by parents or by the doctor), used in 7 studies, self-reporting (5 studies), as well as evaluation by an external observer, included in 3 studies.
- **Method of outcome evaluation** was divided into two groups: objective results obtained in the study (11 studies) and participants' self-reports (4 studies).
- **Evaluator**, the person who provided responses regarding the targeted variables, was another categorical moderator considered. In this case, there were three scenarios: the evaluator was the doctor (2 studies), the parent (5 studies), or the patient (9 studies).

As continuous moderators, the following were considered: (a) age, (b) percentage of girls, (c) percentage of caregivers in a partnership (married or in a stable relationship), (d) percentage of single caregivers (including divorced or widowed caregivers), as well as (e) percentage of Caucasians or (f) percentage of participants of an ethnicity other than Caucasian (given that most studies included a significantly lower percentage of participants from non-Caucasian ethnicities).

### 7.3. Results

**Characteristics of the Studies** The sample sizes of the included studies ranged from 56 to 1,500 participants, totalling 7,013 participants, with an average age between 13 and 16 years and a percentage of girls ranging from 44% to 57% (see Table 7.1).

Table 7.1. Studies characteristics

Year	Author(s)	Title	N	% girls	Mean age	Relationship element	Outcome	Outcome assessment	Time since receiving the diagnosis	Relationship assessment	Rater	Care-giver marital status	% Caucasian	% Other racial groups
2019	Ahrabi-Nejad	Provider-Patient Communication and Transition Readiness Among Adolescents with Type 1 Diabetes	56	44%	15.5	communication	treatment adherence	self-report	>5yrs	self-report	patient	73.7% partnered; 22.9% single	96.50%	5.40%
2018	Caccavale.1	Exploring the role of motivational interviewing in adolescent patient-provider communication about type 1 diabetes	55	49.10%	14.8	communication	treatment adherence	self-report	>5yrs	rater	patient	N/R	76.40%	23.60%
2018	Caccavale.2	Exploring the role of motivational interviewing in adolescent patient-provider communication about type 1 diabetes	55	49.10%	14.8	communication	glycemic control	self-report	>5yrs	Rater	patient	N/R	76.40%	23.60%
2018	Cameron	The clinician factor: Personality characteristics of clinicians and their impact upon clinical outcomes in the management of children and adolescents with type 1 diabetes	1500	50%	13	clinician target and agreeableness	glycemic control	record	>5yrs	self-report	doctor	N/R	N/R	N/R
2015	Carcone.1	Multisystemic Therapy Improves the Patient-Provider Relationship in Families of Adolescents with Poorly Controlled Insulin Dependent Diabetes	144	57%	14	partnership	glycemic control	record	<5 yrs	report	parent	59% single; 41% partnered	23%	77%

2015	Carcone.2	Multisystemic Therapy Improves the Patient-Provider Relationship in Families of Adolescents with Poorly Controlled Insulin Dependent Diabetes	144	57%	14	respectful & supportive care	glycemic control	record	<5 yrs	report	parent	59% single; 41% partnered	23%	77%
2015	Carcone.3	Multisystemic Therapy Improves the Patient-Provider Relationship in Families of Adolescents with Poorly Controlled Insulin Dependent Diabetes	144	57%	14	partnership	glycemic control	record	<5 yrs	report	parent	59% single; 41% partnered	23%	77%
2015	Carcone.4	Multisystemic Therapy Improves the Patient-Provider Relationship in Families of Adolescents with Poorly Controlled Insulin Dependent Diabetes	144	57%	14	respectful & supportive care	glycemic control	record	<5 yrs	report	parent	59% single; 41% partnered	23%	77%
2024	Coyne	Intervention to promote adolescents' communication and engagement in Education and Telephone Case Management for	94	53%	13	communication	glycemic control	record	>5yrs	rater	patient	N/R	96%	4.20%
2005	Howe	Children With Type 1 Diabetes: A Randomized Controlled Trial	75	45%	12.5	telecommunication	treatment adherence	record	<5yrs	report	patient	N/R	55%	46%
1995	Marrero.1	Using Telecommunication Technology to Manage Children with Diabetes: The Computer-Linked Outpatient Clinic (CLOC) Study	106	21%	13.3	telecommunication	glycemic control	record	>5yrs	report	patient	N/R	96.22%	3.77%
1995	Marrero.2	Using Telecommunication Technology to Manage Children with Diabetes: The Computer-Linked Outpatient Clinic (CLOC) Study	106	21%	13.3	telecommunication	glycemic control	record	>5yrs	report	patient	N/R	N/R	N/R
2016	Taylor.2	Satisfaction with the Health	169	52%	13.88	satisfaction	treatment	record	>5yrs	self-report	parent	67% married;	19%	82%

		Care Provider and Regimen Adherence in Minority Youth with Type 1 Diabetes				with the provider	adherence					33% single		
2018	Varni	Diabetes Management Mediating Effects between Diabetes Symptoms and Health-Related Quality of Life in Adolescents and Young Adults with Type 1 Diabetes	418	49.80%	16.3	communication	diabetes management	self-report	>5yrs	self-report	patient	N/R	63.70%	36.30%

Notes: N/R = not reported; N/A = not applicable; yrs = years.

**Overall Effect Size** The meta-regression analysis based on 15 extracted effect sizes revealed a significant impact of the doctor-patient relationship on diabetes outcomes (see Table 7.3), generally across all types of outcomes, with a small correlation coefficient (Schober et al., 2018),  $r = 0.165$ , 95% CI: [0.11–0.21],  $p = 0.000$ .

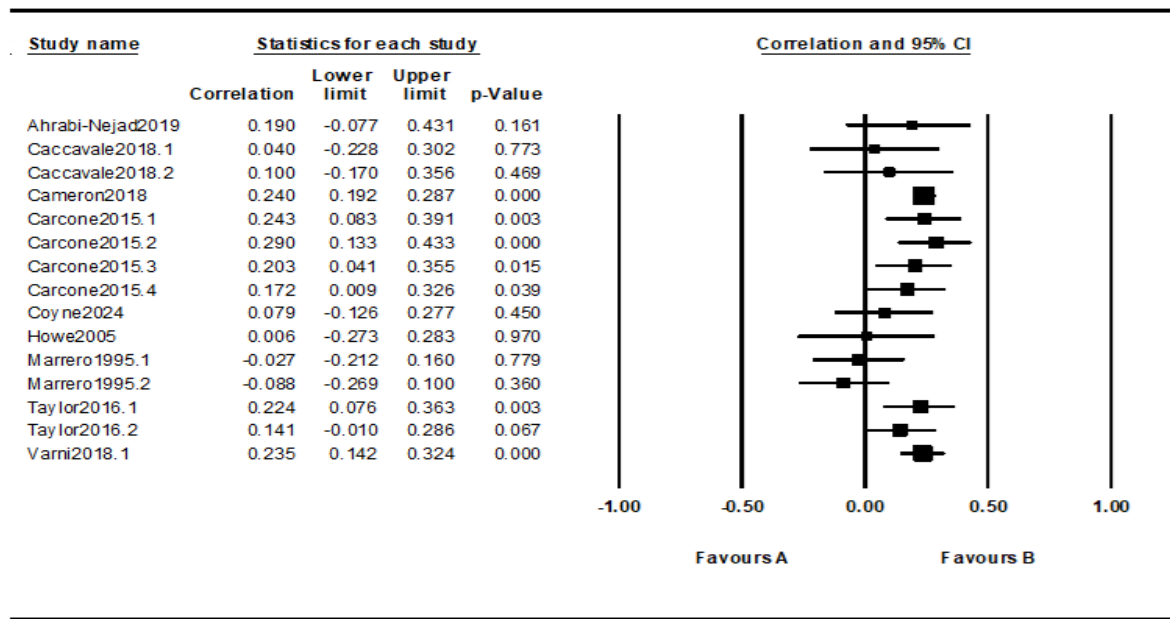
In the separate analysis of outcomes related to the improvement of diabetes-associated symptoms:

- **Diabetes management** was significantly influenced by the doctor-patient relationship, with a correlation of 0.235 and a 95% confidence interval between 0.054 and 0.401,  $p = 0.012$ , based on 6 included effect sizes.
- **Glycemic control** was also significantly influenced, with a correlation of 0.156, 95% CI: [0.080; 0.230],  $p = 0.00$ , based on 9 included effect sizes.
- **Treatment adherence** also saw small but notable changes,  $r = 0.141$ , 95% CI: [0.023; 0.255],  $p = 0.019$ , based on 5 included effect sizes.

Therefore, although at a low level, a good doctor-patient relationship was associated with significant improvements in diabetes management, glycemic control, and treatment adherence.

After excluding studies with extreme values (outside the confidence interval), the results remained significant, with a correlation coefficient nearly one point higher (though still small),  $r = 0.242$ ,  $p = 0.00$ . Additionally, the level of significance remained approximately the same after applying the “one study removed” option,  $r = 0.165$ , 95% CI: [0.110; 0.218],  $p = 0.000$ , indicating that even if any study is excluded, the results remain significant (see Figure 7.2).

Fig. 7.2 Forrest Plot



**Moderator Analysis** The separate evaluation of categorical moderators revealed the following aspects (Table 7.2):

Table 7.2. Categorical Moderators

		N	R	r 95%-CI	I <sup>2</sup>	p
<b>Categorical Moderators</b>						
<i>Doctor-patient relationship elements</i>	clinician target	1	0.240	[0.192; 0.287]	0.000	0.000*
	communication	5	0.185	[0.111; 0.257]	0.000	0.000*
	partnership	2	0.223	[0.111; 0.257]	0.000	0.000*
	respectful and supportive care	2	0.232	[0.119; 0.339]	8.986	0.000*
	satisfaction	2	0.183	[0.077; 0.284]	0.000	0.001*
	telecommunication	3	-0.046	[-0.166; 0.074]	0.000	-0.452

<i>Time since diagnosis</i>	<5 years	4	0.227	[0.123; 0.327]	0.000	0.000*
	>5 years	10	0.145	[0.077; 0.211]	59.224	0.000*
<i>Type of outcome</i>	diabetes management	1	0.235	[0.054; 0.401]	0.000	0.012**
	glycemic control	9	0.156	[0.080; 0.230]	62.144	0.000*
	treatment adherence	5	0.141	[0.023; 0.255]	0.000	0.019**
	report	7	0.137	[0.060; 0.213]	61.167	0.001*
	self-report	5	0.219	[0.152; 0.284]	0.000	0.000*
<i>Outcome assessment</i>	record	11	0.158	[0.092; 0.223]	58.794	0.000*
	self-report	4	0.174	[0.049; 0.293]	0.000	0.007**
<i>Rater</i>	doctor	2	0.198	[0.063; 0.326]	61.666	0.004**
	parent	5	0.209	[0.115; 0.300]	0.000	0.000*
	patient	8	0.114	[0.030; 0.196]	53.675	0.008**

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*Note:* N = number of studies including the outcome; r = the correlation quotient; r 95%-CI = 95% confidence interval of the weighted mean effect size; I<sup>2</sup> = the percentage of total variation across studies that is due to true differences in effect sizes. \*p < 0.001; \*\*p < 0.05.

- **Specific elements of the doctor-patient relationship** had a significant impact, with p = 0.00 and an effect size of 0.175. Among all the included categories, the only element that proved to be non-significant was telecommunication (p = 0.45).

- **Time since diagnosis** also contributed significantly ( $p = 0.001$ ). The most significant contribution came from diagnoses received within the last 5 years, with a correlation of 0.227 ( $p = 0.00$ ), while a period longer than 5 years had a lower effect,  $r = 0.145$  ( $p = 0.00$ ).
- **The method of relationship evaluation** influenced the results ( $p = 0.00$ ), with self-reporting by patients being the most relevant in this regard (correlation of  $r = 0.219$ ,  $p = 0.00$ ), followed by reporting by the doctor or parents, with a correlation of 0.137,  $p = 0.001$ . On the other hand, evaluation by an external observer did not have relevance for the results ( $p = 0.340$ ).
- **The impact of the doctor-patient relationship on diabetes outcomes** also depended on the method of reporting diabetes-related results. In this context, both the recording of objective values and self-reporting by participants contributed almost equally,  $r = 0.158$  and  $r = 0.174$ , respectively, with  $p < 0.01$ .
- **If the study participants were parents**, the relationship between study variables increased most significantly ( $r = 0.209$ ,  $p = 0.00$ ), compared to situations where the participants were either the patients ( $r = 0.114$ ,  $p = 0.008$ ) or the attending doctor ( $r = 0.199$ ,  $p = 0.004$ ), with these last two instances yielding approximately equal results.

Furthermore, after analyzing the continuous moderators, gender distribution did not emerge as a significant moderator ( $p = 0.06$ ). The same was true for the remaining moderators, including the relational status of the primary caregiver ( $p = 0.88$  for both partnered and single caregivers) and ethnicity ( $p = 0.182$  for the percentage of Caucasians,  $p = 0.185$  for other ethnicities). For more details, see Table 7.3.

Table 7.3. Overall effect size

	<b>B</b>	<b>SE</b>	<b>95%CI</b>	<b>I<sup>2</sup></b>	<b>P</b>	<b>p over- all</b>	<b>Q</b>
<b>Overall effect size</b>	0.165	0.004	[0.110; 0.218]	45.388	0.000*	0.000*	25.636

**Effect size for each outcome**

Diabetes management	0.152	0.008	[0.064; 0.237]	0.000	0.606	0.001*	2.719
Glycemic control	0.152	0.009	[0.069; 0.233]	62.144	0.007**	0.000*	21.133
<b>Continuous Moderators</b>							
<i>%Girls</i>	- 0.209	0.110	[-0.426; 0.007]	0.000	0.058	0.056	23.263
<i>Mean age</i>	- 0.264	0.379	[-1.007; 0.478]	0.004	0.485	0.399	14.695
<b>Ethnicity</b>							
<i>%Caucasian</i>	0.274	0.049	[0.177; 0.372]	0.001	0.000*	0.182	17.377
<i>% Other ethnicity</i>	0.044	0.049	[-0.052; 0.142]	0.001	0.367	0.185	17.317
<b>Marital status of caregiver</b>							
<i>%Single/Divorced</i>	0.071	0.238	[-0.395; 0.538]	0.000	0.746	0.887	2.326
<i>%Partnered</i>	0.439	0.441	[-0.370; 1.358]	0.000	0.263	0.887	2.326

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Note:  $\beta$  = slope; SE = standard error; 95%-CI = 95% confidence interval of the weighted mean effect size; I<sup>2</sup> = the percentage of total variation across studies that is due to true differences in effect sizes; Q = variance across studies; p = level of significance for I<sup>2</sup>; p overall = level of significance for the overall effect. \*p < 0.001; \*\*p < 0.01.

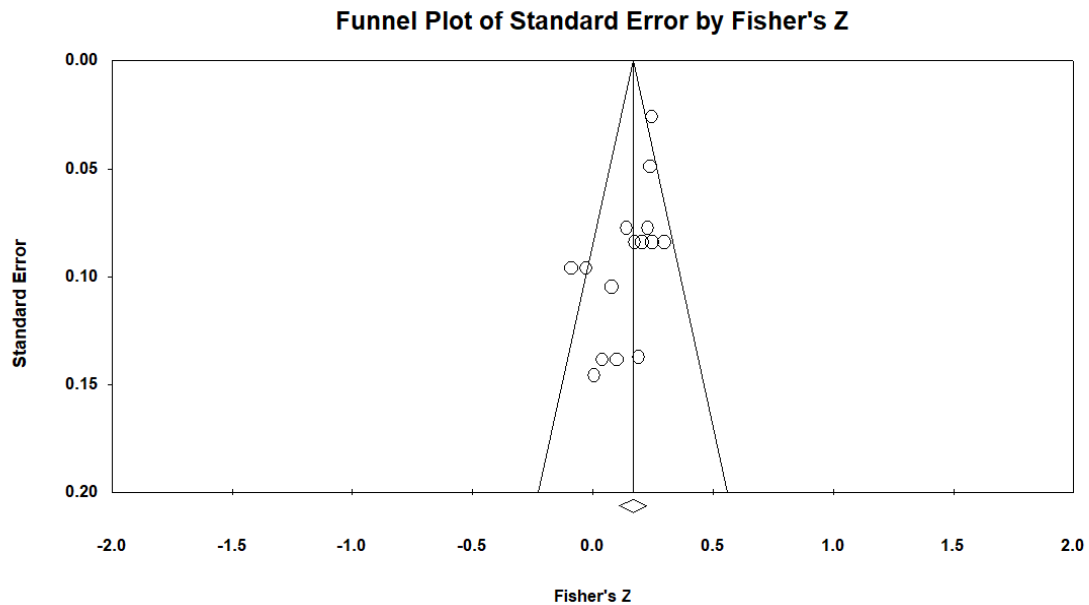
**Publication Bias** Publication bias was assessed through three methods. First, a visual examination of the funnel plot was conducted, where missing studies would have been marked by black dots (Figure 7.3). Next, based on the "Classic fail-safe N," results suggest no significant



publication bias, as a very large number of unpublished studies (approximately 254) would be required to invalidate the current results.

On the other hand, the year of publication proved to be significant (slope = 0.011, 95% CI: [0.005; 0.017],  $p = 0.000$ ), suggesting that study results vary depending on the year of publication.

Fig. 7.3. Funnel Plot



Note: Standard error = the precision of the effect size estimate from each study; Fisher's  $z$  = the transformed correlation coefficients used to standardize the effect size.

#### 7.4. Discussion

The doctor-patient relationship (Ștefănescu et al., 2024) is crucial for successful treatment in cases of pediatric type 1 diabetes, and there are numerous factors contributing to such favorable outcomes. These range from maintaining a supportive and respectful attitude towards the patient to effective communication, goal-setting, and cooperation. All these elements are important to establish a good relationship with the patient and achieve greater treatment efficiency.

Additionally, the patient's level of satisfaction with the cooperation with their doctor further improves the outcomes. A supportive doctor who involves the patient in the decision-making

process of their treatment is more likely to keep patients engaged in following the treatment and health recommendations, which over time will result in lower glycemic control levels.

In conclusion, the present study indicates a lack of significant impact from communication via technology, in contrast to face-to-face communication, which has significant positive effects (Ștefănescu et al., 2024). Moreover, in the case of communication through technological means, information related to treatment or elements necessary to build a strong bond (such as physical presence or non-verbal cues) might be lost in the virtual environment due to the higher volume of stimuli that the patient (or even the doctor) has to manage, thus this form of communication does not produce improvements (Ștefănescu et al., 2024).

## **7.5. Conclusions**

According to the data, most variables that moderate the associations between the doctor-patient relationship (PDR) and diabetes outcomes are related to the attitudes/behaviors adopted by the doctor, specific aspects of the disease (e.g., duration), specific patient characteristics (such as how they perceive the doctor), or the way these aspects were assessed.

Demographic data proved to be insignificant in this case, highlighting the need for future studies to clarify their contribution. The current data are the first to quantify the doctor-patient relationship and its connection with treatment adherence in children with type 1 diabetes through a meta-analytic design, offering clarifications in this field and directions for future research. Integrating these findings into clinical interventions focused on building this relationship, as well as creating tools to measure it, are some ways in which these data could be applied.

## **Chapter 8: General Conclusions**

1. Understanding the particularities of the doctor-patient relationship in children with type 1 diabetes is essential for good management of type 1 diabetes for children, their caregivers, and doctors alike (Coyne, 2024).
2. Psychological flexibility and the importance of psychotherapeutic interventions for children with diabetes are crucial for effective management of the condition, understanding it, and acceptance (Iina, 2021).

3. Beyond the boundaries of good practices in diabetes and metabolic diseases, psychological protocols are needed for children and adolescents with diabetes (Ștefănescu, 2024).
4. As long as patients with type 1 diabetes, who are at a developmental stage that allows for cognitive flexibility, such as pediatric patients (Ayala, 2014), can benefit from counseling or psychotherapy programs that can facilitate this way of relating to reality (Ștefănescu, 2024).
5. In this work, I investigated the impact of a four-week individual ACT intervention on children and adolescents with type 1 diabetes in Romania and how it manages to enhance the doctor-patient relationship. This study is the first of its kind in Romania (Ștefănescu, 2024).
6. Studies conducted on pediatric diabetes and ACT are rare, but the published data on adults with diabetes are consistent with my findings, highlighting the role of ACT intervention (Hayes, 2006) in improving quality of life and mental health outcomes in patients with type 1 diabetes. The transdiagnostic nature of ACT and the individual format in which the intervention was conducted favored the personalization of therapeutic dialogue and addressing topics relevant to the participants' lives (Ștefănescu, 2024).
7. The results of the two comparative studies on children, adolescents, and adults emphasize the particularity of the doctor-patient relationship in children and adolescents with diabetes, showing that the pediatric population is much more open to psychological flexibility compared to adults. Most doctors can benefit from more compliant patients who understand the immutable limits of the system and who relate to it flexibly, following psychological interventions (Ștefănescu, 2024).
8. The doctor-patient relationship is essential for successful treatment in cases of pediatric type 1 diabetes, and numerous factors contribute to such favorable outcomes (Lassen, 2023). From maintaining a supportive and respectful attitude towards the patient to communication, goal-setting, and cooperation, all these elements are important to establish a good relationship with the patient and achieve greater treatment efficiency. Additionally, the patient's satisfaction with the cooperation with their doctor further improves outcomes. A supportive doctor who involves the patient in the treatment decision-making process is more likely to keep patients engaged in following treatment

and health recommendations, which over time will result in lower glycemic control levels. Zolnierek and DiMatteo (2009) emphasize, in their systematic review, the importance of adopting an equal-to-equal attitude, especially in the case of adolescents, as well as communicating in terms as close as possible to the patients' level of understanding of the disease and its effects.

9. Future studies need to address these gaps in the literature by adopting a quantitative design and using established psychometric tools. This way, the existing information (Lassen, 2023) could be more solid and with a higher level of generalization of the results.
10. As highlighted by the results of my meta-analysis, although at a lower level, the doctor-patient relationship (Cameron, 2018) contributes to improving progress indicators in pediatric patients with diabetes, an improvement that in some cases could mean the decision to continue treatment.
11. As the data obtained by me have shown, most variables that influence these associations are related to the attitudes/behaviors adopted by the doctor, but also specific aspects of the disease (duration, for example), specific patient characteristics (how they perceive the doctor), or how these aspects were evaluated. Demographic data proved to be insignificant in this case, highlighting the need for future studies to clarify this.
12. For the doctor-patient relationship to impact diabetes management (Ridd, 2009), it is essential that the patient, first and foremost, perceives a good relationship with the doctor, as they are the main actor involved in both managing diabetes symptoms and creating a direct connection with the doctor.
13. The data I obtained are the first to measure through a meta-analytic design the doctor-patient relationship and its effect on treatment adherence in children with type 1 diabetes, providing clarification and nuance in this field regarding its level of influence. Integrating them to create clinical interventions focused on building this relationship, as well as creating tools to measure the relationship, are some ways in which this data could be applied.
14. At the same time, the data from my meta-analysis showed that gender distribution did not influence the association of the targeted variables, meaning that the doctor-patient

relationship impacts diabetes-related outcomes similarly in both boys and girls. Furthermore, the lack of significance of age, caregiver's marital status, or the participants' ethnicity shows that the same is true for other demographic variables. Therefore, the way the doctor-patient relationship influences diabetes-related outcomes (Cleves Valencia, 2024) seems to manifest similarly regardless of ethnicity, age, or parental marital status in children, with the most important aspect being the direct involvement of the actors in the relationship (considering that only variables measuring such an aspect were significant).

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