

## Article

# Sense of Coherence as a Resource in Promoting Well-Being and Managing Type 1 Diabetes Mellitus: A Pilot Study

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**Abstract:** When investigating the feelings of caregivers to patients with T1DM, parental stress, anxiety, and depression are found to be most prevalent, especially in the diagnostic phase and in the first months after diagnosis. In this pilot study, we research various significant elements regarding the well-being of mothers with children between 10 and 15 years of age with a chronic condition. The study focuses on a period of at least three years after the child's diagnosis. The aims of the study are to describe our sample's levels of satisfaction (SWLS) and subjective happiness (SHS) and to evaluate possible associations. A sample of 40 mothers was offered a series of assessment tools about psychological skills that could play a role in improving mothers' well-being: the use of specific coping mechanisms (CISS), the methods of narrating the experience of life with a son/daughter with diabetes, the sense of coherence (SOCs 29), health parameters vs. child's disease (HbA1c, CBCL), and socio-demographic, such as education and work. The most significant associations with respect to subjective happiness are with the sense of coherence, as a unitary value and as distinct factors, and with task-oriented coping. Sense of coherence is also associated with satisfaction.

**Keywords:** happiness; satisfaction; mothers; T1DM; sense of coherence; coping



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## 1. Introduction

Type 1 diabetes mellitus (T1DM) is one of the most common chronic diseases in paediatric age, with an increase in incidence of 4% each year. Among the chronic diseases, T1DM is also one of those that requires greater care to maintain good health. Diabetes management requires engaging with different aspects of disease management, such as intervals between meals, blood sugar monitoring, administering insulin and blood sugar control, and, lastly, physical activity. The complexity of management is compounded by the fear of ineffective blood sugar control, particularly hypoglycemia [1–3]. Diabetes management goals take priority over educational ones [4]. The diagnosis of T1DM in a child involves the whole family and presents a complex situation. The literature indicates that a family member's malaise (stress, anxiety, depression) has an impact on others. More specifically, parental psychological distress may be associated with their child reporting higher levels of stress and depressive symptoms, their child displaying more problematic behaviour, and/or their child reporting a diminished quality of life [5,6]. Further associations identified were: negative metabolic control and poor blood sugar management [6–8].

Various studies in the literature have investigated psychological variables in parents of children with diabetes. With respect to psychological distress, a systematic mixed-studies review [9] found a prevalence of parental psychological distress ranging from 10% to 74%, with an average of 33.5% of parents reporting discomfort at diagnosis, and 19% of parents reporting discomfort from 1 to 4 years after diagnosis. Anxiety symptoms ranged from 21% to 59%, depressive symptoms from 10% to 74%, psychological distress from 29% to 33%, and PTSD symptoms from 19% to 24% in parents of children with Pinquart [10]. This

meta-analysis related to parents of children with a chronic condition, and showed small-to-moderate elevations of general parenting stress and stress related to the parent–child relationship specifically. In particular, the study showed moderate-to-large increases in health-related stress in parents. In a previous study, Cousino and Hazen [11] estimated the difference between parenting stress of parents with healthy children and those with children with chronic diseases ( $d = 0.40$ ;  $p \leq 0.0001$ ). PTSD was found in 24% of mothers and 22% of fathers, and partial or subclinical PTSD symptoms in 51% of mothers and 41% of fathers [12]. Regarding depression, elevated symptoms were evidenced in 33% of caregivers [8]. In a more recent study [13], 26% of caregivers reported clinical levels of depressive symptoms, with no significant change over time, at the six-month assessment (23%) and the 12-month assessment (19%). Moreira et al. [14] found higher levels of anxiety among parents of children with T1DM (8–18 years) compared to parents of healthy children, but, unlike other studies, no differences were found between the two groups regarding symptoms of depression. In a recent study [15] on families with children with pediatric T1DM, significant differences were found with respect to stress ( $F [1475] = 8.43$ ,  $p < 0.01$ ), depressive symptoms ( $F [1477] = 6.46$ ,  $p < 0.05$ ), and anxiety symptoms ( $F [1476] = 21.90$ ,  $p < 0.001$ ), but only with regard to mothers and not fathers. These conclusions could be explained by the fact that the mother, in various parts of the world, continues to be the parent who takes on greater responsibility in childcare and even more so when caring for sick children. The literature has also shown psychological factors, such as anxiety, depression, parental stress in childhood, mindfulness, self-efficacy, quality of life, and sleep disturbances to be associated with parental fear of hypoglycemia [16]. Blood glucose control, as well as other daily care practices, are often handled by mothers more than by fathers, and this may be a contributing factor in differentiating the psychological variables of parents. A further explanation could be traced back to the sense of loneliness that mothers of children with T1DM often feel [8,17]. Various studies pointed out how mothers, in particular, were at greater risk of developing anxiety, depressive symptoms, and PTSD symptoms [12,15,17–19], although not all studies have found gender differences [20].

We would also point out that in the various studies mentioned, the percentages were in a rather wide range, perhaps due to the different instruments used or also to cultural variables and the different effectiveness of medical treatments. Currently, diabetes treatments are generally effective and minimally invasive, and this probably also modulates the representation of the disease and the psychological experience of patients and family members. In this study we have chosen a different perspective: we wanted to focus on positive aspects rather than on negative experiences. To say, for example, that one-third of parents with children with diabetes are depressed may be a positive finding, since 70% are not, but implicitly it is communicated that depression is being investigated because there are good reasons why parents may be depressed. Certainly, these investigations are important because it is necessary for health professionals to consider this possibility and intervene to support or treat the family or couple members. However, it seems to us equally significant to be able to convey the information, to caregivers and parents, that there is also the possibility that they are happy and satisfied with their lives. Knowing that one can live well can help one to live well.

In this study, therefore, we chose to focus on mothers and assess whether women with sick children are happy and satisfied with their lives, and what elements can contribute to these evaluations. The assessment of mothers' well-being is not only significant in itself, but also plays an equally significant role in the health of the children. In fact, a mother with depressive symptoms has a negative impact on their child's health [21–23], and a shared theory concerning happiness recognises that part of it is based on genetic predisposition and early experiences [24]. Recently, Chi et al. [25] highlighted the existence of a sort of contagion, both in a positive and negative way, between parents and children when it comes to well-being, happiness, and satisfaction, highlighting how the positive characteristics are even more susceptible to transmission than the negative ones. Being affected by a disease can have an effect on one's happiness, although it does not represent an absolute

impossibility of happiness [26]; the relationship with a happy and satisfied mother could constitute an element capable of counteracting the burden of disease on happiness. With regard to how physical health is affected, the assessment of the impact of psychological and relational conditions on illness has long been addressed in various studies, especially from a psychosomatic perspective, and more recently a positive perspective, which can be found in Aaron Antonovsky's salutogenic approach and in Positive Psychology. Literature reviews and meta-analyses of the scientific literature have concluded that subjective well-being can be beneficial to health [27–29]. This, therefore, justifies the interest in the psychological well-being of mothers with children suffering from chronic conditions.

Following our aim, the study sought to understand after the first moments of diagnosis when negative experiences are considerable [30], how mothers experience a condition of actual chronicity of their children. As a result, mothers of children who had been diagnosed with T1DM at least 3 years ago were recruited. A relatively quiet and still little-studied paediatric age was also chosen: an age group between 10 and 15 years. Younger children generally require more punctual care and an organisation that is still very focused on their needs. On the other hand, older children tend to have the additional complex adolescent dynamics, which involve the children just as much as their parents. In this exploratory study we applied, in a relatively small sample, a series of assessment tools related to psychological skills that could play a role in building mothers' well-being. The study's aims were to describe the levels of satisfaction and happiness in the sample and to evaluate possible associations. In particular, the following were considered: the use of specific coping mechanisms, the ways of describing living with a diabetic child, the sense of coherence, health parameters vs. illness of the child, as well as socio-demographic variables such as education and work. Significant associations will then need to be studied on a larger sample.

## 2. Materials and Methods

The research was approved by the Department of Clinical and Experimental Sciences of the University of Brescia and then forwarded to the provincial ethics committee, which is the institution responsible for evaluating all research for the Brescia area. The research was unanimously approved under code number 1880.

The diabetologist pre-selected the parents to be proposed for the research, according to the following inclusion criteria: (a) diagnosis of diabetes mellitus at least three years ago; (b) current age of the patients between 10 and 15 years; (c) understanding of the Italian language (for both patients and parents). Parents would be asked by the diabetologist for an outline of their willingness to collaborate on a research project, and if so, a meeting would be scheduled with a researcher who would explain the project. The meeting usually coincided with the patients' regular checkups. In a confidential room, parents would receive information—either through a written form or orally—and the opportunity to ask questions. Those who decided to cooperate were asked to sign the informed consent form and then proposed protocols. The attending parent was given an envelope with the tests for their partner as well. The attending parent was almost always the mother; few protocols were completed at home and returned, so fathers' responses were omitted from the analysis. Thus, the sample consisted of 40 women.

With respect to schooling, half of the sample (48.8%) did not receive higher education, while 26.8% have a high school diploma (equivalent to GCSEs), and 24.4% hold a degree. Most of the people interviewed work outside the home (Table 1).

The statistical sample (40) had an average age of 42.74 years, a mode of 46, a standard deviation of 3.72, a minimum value of 35, and a maximum value of 52.

The majority of the interviewees are married (80%) or cohabiting (10%). Almost all women have more than one child and the child with diabetes is: the first-born in 27.9%, the second-born in 39.5%, the third-born in 20.9%, and the fourth-born in 7%. Children with diabetes are mostly male (62.8%).

**Table 1.** Occupation of the mothers.

	Frequency	Percentage
Architect	1	2.5
Craftsperson	1	2.5
Health Assistant	2	5
Bartender	1	2.5
Housewife	8	20.0
Shop Assistant	1	2.5
Accountant	1	2.5
Educator	1	2.5
Beautician	1	2.5
Paediatric Physiotherapist	1	2.5
Marketing Graphic Designer	1	2.5
Employed	6	15.0
Nurse	1	2.5
Teacher	5	12.5
Occasional Housework	2	5
Freelance (Graphic)	1	2.5
Factory Worker	5	12.5

### 2.1. Instruments

The mothers were offered a socio-personal data sheet and were asked to write, for a maximum of ten minutes, about the experience of having a diabetic child, without worrying about spelling and syntax, but writing freely what came to mind. The following tests were also proposed: Satisfaction with Life Scale, Subjective Happiness Scale, CISS, Socs 29, and CBCL.

The glycated hemoglobin values of the children were provided, with prior consent, by the doctor of the Paediatric Clinic of the University Hospital (Spedali Civili) of Brescia.

Measurements of glycated hemoglobin (A1C) were used to assess diabetes management. An optimal A1C level was defined as <7.0% (<53 mmol/mol) [31].

#### *The Subjective Happiness Scale (SHS)*

The subjective happiness scale was used to measure the overall level of perceived happiness [32]. The SHS is a self-assessment measure consisting of four elements on a 7-point scale. The total score ranges from 4 to 28. Higher scores represent greater overall happiness. Two items are aimed at evaluating the general feeling of happiness, e.g., “I generally consider myself a not very happy/very happy person”, and the other two assess the perception of their happiness in relation to peers, e.g., “Compared to most of my peers, I consider myself to be: less happy/happier”. The SHS has shown that it has sufficient internal consistency and test-retest reliability. The Italian version was used [33]. Cronbach’s  $\alpha$  in our sample was 0.731, thus confirming satisfactory reliability.

#### *The Satisfaction with Life Scale (SWLS)*

The Satisfaction with Life Scale (SWLS) [34] is a self-assessment scale that measures general life satisfaction. “If I could relive my life, I would change almost nothing” is an item of scale. The total scores on the scale are calculated by averaging the responses to the 5 items and therefore range from 1 to 7. A higher score indicates greater overall satisfaction with life. It has been shown that the SWLS is a psychometrically good tool to quickly measure life satisfaction, and it has a strong internal reliability ( $r = 0.87$ ) and moderate temporal stability ( $r = 0.82$ , two months of test-retest reliability). The Italian version of the scale was used [35,36]. Cronbach’s  $\alpha$  in our sample was 0.843, thus confirming good reliability.

#### *The Sense of Coherence (SOC 29)*

The Sense of Coherence Construct [37] evaluates an individual’s overall orientation of trust towards life. In the scale, made up of 29 items, the three components described refer to three factors: comprehensibility, which refers to the cognitive component of the construct; manageability, which concerns the instrumental component; and meaningfulness, which refers to the motivational component. The response alternatives are a semantic scale of 1 to

7 points. The questionnaire yields a total score with a range from 29 to 203. “Do you think there will always be people you can count on in the future? How often do you feel that there is little meaning in the things you do in your daily life? Does he have very confused ideas and feelings?” are examples of items on the scale. The Italian version was used [38]. Cronbach’s  $\alpha$  in our sample was 0.822, thus confirming good reliability.

#### *Coping Inventory for Stressful Situations (CISS)*

The Coping Inventory for Stressful Situations [39] is a self-describing coping assessment tool based on Endler’s interactive model of stress, anxiety, and coping. It is a multidimensional coping tool consisting of 48 items divided into 3 scales: T task-oriented (Maneuver), E emotional-oriented, and A avoidance oriented, which in turn consists of 2 subscales: D distraction, and SD social diversion. For each item the subject is asked to indicate the frequency on a 5-point scale, ranging from 1 “not at all” to 5 “very much”. “I worry about what; I am going to do; I get angry; I go for a walk; I phone a friend.” are examples of items. The Italian version of the scale was used [40]. Cronbach’s  $\alpha$  in our sample was 0.706, thus confirming satisfactory reliability.

#### *Child Behaviour Checklist (CBCL)*

The CBCL (Child Behaviour Checklist) is a 112-item parent-report. Each item is scored on a 3-point scale, ranging from 0 to 2. CBCL has two groupings of syndromes: internalising problems (grouped as anxious/depressed, withdrawn/depressed, and somatic complaints); and externalising problems (grouped as rule-breaking behaviour and aggressive behaviour). Furthermore, the CBCL 6–18 identifies the following syndrome scales: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behaviour, aggressive behaviour, and other problems. The CBCL has sound psychometric properties [41], and the Italian version was validated by Frigerio et al. [42]. Cronbach’s  $\alpha$  was 0.835 in our sample, confirming good reliability.

## 2.2. Statistical Analysis

The database was formatted using Microsoft-Excel<sup>®</sup> and later imported from IBM-SPSS<sup>®</sup> ver. 26.0.1 (IBM SPSS Inc., Chicago, IL, USA). Normality of the distributions was measured using the Kolmogorov-Smirnov test. Categorical variables were presented as frequencies or percentages and compared with the use of the Chi-Square test or the Fisher’s exact test, respectively. Continuous variables were presented as means  $\pm$  SD (in case of a normal distribution), or medians and min./max. (in case of a skewed distribution) and compared with the use of the Mann-Whitney and Kruskal-Wallis tests, and correlations among variables by the Spearman’s rank correlation test. A two-sided  $\alpha$  level of 0.05 was used for all tests.

For the analysis of the texts, the software “Linguistic Inquiry” and “Word Count 2015” (LIWC) was used [43].

## 3. Results

The SHS scores range from 2.75 to 6.75 with a mean of 5.17 and standard deviation 1.053, while the SWLS has a range from 10 to 33 with a mean of 24.81 and standard deviation 5.88. The Socs29 values range from 111 to 179, with a mean of 146.43 and standard deviation 17.75, while the range of the Comprehensibility factors goes from 32 to 65, the Manageability factor 40 to 62, and the Meaning factor from 32 to 64.

As regards the CISS, although the reduced number does not allow for statistical comparisons, we point out how, compared to the Italian standardisation, there is a deviation in favour of the Maneuver (+1.87) and Emotion (−2.42), Avoidance (+5.13), Distraction (−2.95) and Social Diversion (0.46) in our sample.

Compared to the production of texts, they are composed of an average of 117 words, but there it ranges from 16 to 266 words. Among the most used categories of terms, affect words stand out, and positive emotions outweigh negative ones. Nobody uses the term ‘anxiety’, and the presence of anger and sadness is very low. There is a certain attention to time, mainly on the present, followed by a focus on the future. Personal concerns include

work, followed by religion. There are references to health/illness, but none to death. In almost all the texts there is a reference to the onset of the disease, even when this was a relatively long time ago. The connotation of this diagnosis is always quite dramatic; the diagnosis represents a sudden change and an abrupt break in daily routine, there is a “before” and an “after”. The stories testify to the ability to live with the disease and to value the positive aspects of life, especially family relationships and genuine friendships. The qualities of sick children are valued, sometimes with idealised aspects, like little heroes.

As for patients, Table 2 shows the glycated haemoglobin values.

**Table 2.** Values of Glycated Haemoglobin (HbA1c).

HbA1c %	Frequency	Percentage
6.60	3	7.5
6.90	1	2.5
6.95	1	2.5
7.00	1	2.5
7.10	1	2.5
7.20	3	7.5
7.30	3	7.5
7.40	1	2.5
7.50	4	10.0
7.60	1	2.5
7.70	3	7.5
7.80	3	7.5
7.90	1	2.5
8.10	4	10.0
8.20	1	2.5
8.60	3	7.5
8.80	1	2.5
8.90	2	5.0
10.30	1	2.5
11.40	1	2.5
14.00	1	2.5
Total	40	100.0

As for the CBCL, three quarters of patients do not have critical scores, except in the ‘thought problems’ scale and, in the syndromes internalising problems in which the percentage of those with a potentially pathological or border score reaches 35.7%. For the other scales, the percentages are as follows: anxious/depressed, 23.8%; withdrawn/depressed, 21.4%; somatic complaints, 2.4%; social problems, 16.7%; attention problems, 19%; rule-breaking behaviour, 21.4%; aggressive behaviour, 7.1%; and externalising problems, 28.6%.

With respect to the correlations, the statistically significant or tending to significance data is shown in Table 3.

**Table 3.** Correlations Between SHS Subjective Happiness Scale, Glycated Haemoglobin, Socs 29 Sense of Coherence, and SWLS Satisfaction with Life Scale.

		SHS	HbA1c	SOCS	SWLS
HbA1c	Correlation coefficient	−0.085			
	Sign. (two-tailed)	0.613			
SOCS 29	Correlation coefficient	0.674 **	−0.442 **		
	Sign. (two-tailed)	0.000	0.009		
SWLS	Correlation coefficient	0.506 **	−0.172	0.431 *	
	Sign. (two-tailed)	0.002	0.323	0.012	

\*\* . The correlation coefficient is significant at 0.01 (two-tailed). \* . The correlation coefficient is significant at 0.05 (two tailed).

All Socs factors, i.e., comprehensibility, manageability, and meaning, correlated with subjective happiness ( $p = 0.01$ ). A weak and inverse correlation ( $p = 0.05$ ) between satisfaction and cognitive processes, as assessed by the LIWC, and the correlation ( $p = 0.01$ ) between happiness and the use of Task-oriented coping (Maneuver) must be added to this. Other associations with respect to both happiness and satisfaction, with work, the educational qualification, other categories of the written text, coping strategies, and the child's behavioural syndromes and the levels of glycated haemoglobin were not significant.

#### 4. Discussion

The literature showed that parents, particularly mothers, of children with T1DM suffer from anxiety and depression, especially at the beginning of their child's illness; over time they were generally able to find a satisfactory balance that allowed them to live with diabetes [44–46]. In our sample, the absence of anxiety and depression, the quality of the mothers' writings, and the levels of happiness and satisfaction suggest a satisfactory balance. The ability to use coping strategies to deal with stressful situations is also a central element of adaptation. The more anxious and depressed the caregivers of T1DM patients are, the more they use emotion-focused coping strategies and maladaptive coping strategies, such as avoidance and distraction [47]. In our sample, there is more task-oriented coping and less emotion-oriented coping, and the former is correlated with subjective happiness.

Interestingly, both satisfaction and happiness in mothers are not associated with the child's psychophysical health, neither with regard to blood sugar levels nor with regard to the presence of psychological disorders, both internalising and externalising. It does not seem plausible that a child's health does not have an impact on their mothers' well-being; instead, it seems that this data should also be interpreted as an indicator of adaptation, as a capacity to reshape expectations and aspirations, and also as a rediscovery of fundamental values. In short, we could say that the lack of association does not depend on a kind of insensitivity, but, rather on a greater sensitivity, which is able to grasp the positives that go beyond illness, as testified by the stories of the mothers in our sample, and as also documented in the literature on other more serious illnesses [48].

We highlight how, among the various indices considered, the only one that presents positive associations with a mother's well-being, that is, with both happiness and satisfaction, is Socs 29. The ability to perceive internal and external reality as coherent; being able to interact effectively with the environment; perceiving tasks that need to be completed as stimulating or worthwhile, constitute, for our sample, key elements for well-being. This element also seems very significant to us; we experience many things in life over which we have no control, e.g., the illness of a child, but it is up to us how we interpret and deal with the cards we are dealt. These mothers seem to be saying that a part of happiness is up to them, and they can achieve it.

It is very interesting that these indicators are the only ones, among those considered in the study, associated with blood sugar levels. We seem to interpret that a mother's belief in effective interactions with reality may have been perceived (and learned?) by the child, supporting the belief in the possibility of adequate control of diabetes; this belief plausibly informs and supports appropriate behaviour. We also believe that the transmission of this belief through the mother's attitude of consistency can found a learning that will accompany the child when it comes to diabetes management practices and managing the disease on their own.

We further hypothesise that the ability to describe the experience of living with a diabetic child did not give rise to significant associations, not because it was unimportant, but because all subjects in the sample demonstrated this ability. We hypothesise that the ability to describe experience and the sense of coherence may be two integrable elements, the latter of which could indicate a higher level of maturity. Referring to affective neuropsychanalysis [49,50], we can think of the dramatic accounts of the diagnosis as the perception of the fallacy of (previous) predictions, which had guided the contact with

reality. Good levels of the sense of coherence can be interpreted as the ability to construct new and effective predictive models of the world.

The association between happiness and task-oriented coping reinforces the idea of a capacity to act in realities.

This study has some points of interest, given by the focus on a mother's well-being and by the possibility of evaluating in a time of effective chronicity, more elements of possible association, but it also has several limitations. Being a pilot study, it certainly has the limitations of the sample size, and the lack of a follow-up analysis to verify the validity of the data. In addition, other variables should be tested starting from the support of the social environment and especially of the spouse/partner; it would also be interesting to evaluate the responses in a sample of fathers. A further limitation is that a specific age group of children was chosen, and therefore it is possible that the answers would be dissimilar at different ages. It does, however, have the advantage of attempting to assess well-being not with a global indicator of resilience, but in relation to experience-processing capacities that can be stimulated and promoted in the care and support of families.

Based on the reported evidence, we would like to initiate a longitudinal study of pediatric type I diabetes mellitus, planning to test fathers and mothers in the first month after diagnosis and with a follow-up over the course of 4 years. Data from the Socs 29, SHS, and SWLS will be evaluated in relation to the well-being vs. malaise of the children by specifically considering data on disease management and significant aspects of life, such as social life, school performance, and any traumatic or serious family events.

## 5. Conclusions

Although the data must be evaluated in the field and in large samples, a sense of coherence appears to be central to the happiness and satisfaction of mothers with children with diabetes, as well as diabetes management. We may think that increasing the sense of coherence could be a valid and measurable goal of healthcare professionals. In particular it can be promoted in therapeutic educational courses [51], thus promoting effective diabetes management and the well-being of families.

**Author Contributions:** P.M. is the main researcher who designed the study, researched the literature, analysed the mothers' texts, and wrote the manuscript. C.T. and A.M. analysed the data. All authors have read and agreed to the published version of the manuscript.

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**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki and approved by Provincial Ethics Committee of Brescia Provincial Ethics (approved protocol number 1880).

**Informed Consent Statement:** Written informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Data will be available upon reasonable request.

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