Article

"One and a half years of things we could have done": multi-method analysis of the narratives of adolescents with T1D during the COVID-19 pandemic

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Abstract: Background: The global prevalence of anxiety and depressive symptoms in adolescents has increased considerably during the COVID-19 pandemic. Mental health problems may compromise glycemic control in young people with type 1 diabetes; however, evidence of improved glycemic control in adolescents with T1D appeared early during the pandemic. This qualitative study aimed to provide a more in-depth understanding of how the COVID-19 pandemic affected adolescents with type 1 diabetes routines, experiences, T1D management, behaviors, and mental health. Methods: 24 adolescents, aged 15-18 years, with DM1, joined the discussion of focus groups in the context of the summer camp for diabetes. Word frequency and thematic analysis were conducted on adolescents' narratives. Results: The word Frequency Analysis identified 'friends', 'family', and 'home' as the most frequent terms. Seven themes were identified: (1) COVID-19 and T1D; (2) emotional reactions to the COVID-19 pandemic; (3) changes in daily life; (4) feelings of loss; (5) coping with the COVID-19 pandemic; (6) the COVID-19 pandemic as an opportunity; (7) return to (new) normality. Conclusions The COVID-19 pandemic may have represented a more stressful condition for adolescents with DM1, facing additional challenges compared to their healthy peers. The results offer directions to the diabetes care team for a customized intervention while the consequences of the pandemic on adolescents' health continue.

Keywords: Type 1 diabetes; mental-health; COVID-19; adolescents; qualitative research; narratives, NVivo.

Citation: To be added by editorial staff during production.

Academic Editor: Firstname Lastname

Received: date
Accepted: date
Published: date

1. Introduction

Type 1 diabetes (T1D) is one of the most common chronic diseases in childhood and adolescence, with 1.211.900 youth (0-19) living with the disorder worldwide [1].

In type 1 diabetes, inadequate insulin secretion requires adherence to a lifesaving therapeutic regimen that includes blood glucose monitoring, multiple insulin administrations, carbohydrate counting, and regular physical activity [2]. Adequate glycemic control requires patients to perform strict daily self-management tasks responding to changes in activity, food, and physiology [3]. Daily management of diabetes could expose patients to increased stress, particularly during difficult transitions, such as adolescence. Adolescents with type 1 diabetes, while dealing with normal major physical, cognitive, emotional, and relational changes, assume increasing diabetes self-management responsibilities with emerging independence from caregivers. Pubertal insulin resistance, decreased adherence to the treatment regime, decrease in parental involvement, prioritization of social life, and risk taking behaviors contribute to the deterioration of glycemic control deterioration commonly observed among adolescents with DM1 [4]. Furthermore, eating, mood and anxiety disorder, twice as common among

 doi:10.20944/preprints202212.0578.v1

adolescents with DM1 as peers without diabetes, can compromise diabetes management, glycemic control, and quality of life [5].

Patient education is the key to the successful treatment of type 1 diabetes [3]. In pediatric patients, education in the management of T1D includes the proposal of summer camps for diabetes. Diabetes camps consist of a 7-day medically supervised stay, allowing children and adolescents with T1D to meet and share their experiences while learning autonomous diabetes care, enjoying recreational activities, and strengthening their relationship with the pediatric diabetes team [6].

The global prevalence of mental illness among young people has increased considerably during the COVID-19 pandemic [7-11] when 'stay at home' order and social isolation disproportionately affected the health of children and adolescents. Anxiety and depressive symptoms were particularly common among young people with chronic diseases [10], including adolescents with type 1 diabetes.

At the onset of COVID-19, adolescents with DM1 faced additional challenges compared to their healthy peers, which could have negatively influenced their mental health: while exposed to public discussion about the increased risk of the severe course of Sars-CoV-2 in patients with diabetes, housebound adolescents with DM1 needed to adjust their therapeutic regimen to profound changes in daily routines [12]. Concerns have arisen about possible detrimental effects on glycemic control.

However, early during the pandemic, evidence of improved glycemic outcomes appeared among children and adolescents with type 1 diabetes. Reduced physical activity but slowed-down routines, scheduled mealtimes, and more attention to self-care, with more regular insulin administration and frequent glycemic monitoring, may have contributed to better glycemic outcomes. Increased parental control and suppression of sport, school, and social occasions where adolescents struggle to adhere to T1D therapy could account for better diabetes-related outcomes. Regular consumption of homemade meals may have facilitated the counting of carbohydrates. The awareness that poorly controlled T1D could worsen the outcomes of SARS-CoV-2, as evident in the adult population, may have improved the compliance of patients with diabetes management [13-16].

The potential short- and long-term implications of the COVID-19 emergency on adolescents with psychological well-being with T1D remain partially unclear to date, with little evidence trying to better explain improved glycemic outcomes in children and adolescents more frequently anxious and depressed. Therefore, this study intended to explore the possible psychological and behavioral consequences of COVID-19 in this group and to understand the perspective of adolescents on evidence of improved glycemic control.

Specifically, our qualitative study aimed to expand on the current literature by providing a more in-depth understanding of how adolescents with T1D were doing and how the COVID-19 pandemic affected their routines, experiences, T1D management and psychological health. For this purpose, we explored the feelings and cognitions of adolescents through their narratives.

2. Materials and Methods

2.1. Participants

We enrolled 24 adolescents (M/F = 17/7) aged 15-18 years (mean age = 16.75; SD = 1.07) with type 1 diabetes (mean time from diagnosis = 7.63 years; SD = 4.92; range = 1-16 years) followed up in the Pediatric Diabetes Unit at Padua University Hospital (Italy).
All participants were continuous/flash glucose monitor users, 5 were on continuous subcutaneous insulin infusion (CSII), and 19 were on multiple daily insulin injections (MDI) therapy. Inclusion criteria were age between 15 and 18 years, duration of T1D of at least one year at enrollment, and voluntary participation in a 7-day diabetes summer camp. Exclusion criteria were: comorbidity with psychiatric disorders, poor

 doi:10.20944/preprints202212.0578.v1

comprehension of the Italian language, and refusal to participate in diabetes camp activities.
Medical data on diabetes therapy and duration of diabetes were derived from clinical medical records. Table 1 describes the demographic and clinical data of the participants.

Table 1. Demographic and clinical characteristics of the participants at enrollment.

Participants' characteristics at enrollment		Number of participants
Age	15-16 years old	9 (37.50%)
	17-18 years old	15 (62.50%)
Gender	male	17 (70.83%)
	female	7 (29.17%)
T1D duration	< 5 years	7 (29.17%)
	5-10 years	10 (41.67%)
	> 10 years	7 (29.17%)
Therapeutic regimen	CSII	5 (20.83%)
	MDI	19 (79.17%)

2.2. Procedures

Data collection was carried out between July 26 and August 1, 2021, in the context of diabetes summer camp. At the time of data collection, the epidemiological risk of our country was considered low and restrictions were considerably eased.
The campers participated in focus group discussions. Focus groups typically consist of a specific topic-focused discussion among pre-selected participants with a shared background (ie, adolescents with T1D during the COVID-19 pandemic) related to the research issue. The questions asked by a trained moderator are carefully designed to stimulate discussion among participants. The focus groups aim to gain a more in-depth understanding of the issues discussed from the perspectives of the participants. This makes focus groups an ideal method to explore topics about which little is known or to clarify unexpected results from previous quantitative investigations.
Specifically, each participant joined two focus groups during the camp. Focus groups were simultaneously conducted by two psychologists (A.N. and M.C.). A 'schedule' focus group was discussed prior to the camp, so that the moderators could address the same topics. The focus groups were recorded and transcribed verbatim.
Written informed consent, including permission for audio recording, was obtained from the campers and their parents prior to data collection. Our investigation complied with the Declaration of Helsinki.

2.3. Data Analysis

Data were analyzed using a multimethod approach that included quantitative analysis (word frequency analysis) and qualitative analysis (thematic analysis).
The most frequent words were checked through NVivo, a computer-assisted qualitative data analysis software that helps qualitative researchers collect, organize, analyze, visualize, and report the collected data [17].
In particular, after conducting preliminary word frequency analysis on integral transcripts, we checked the potentially ambiguous meaning of some of the 100 most frequent words (that is, 'good / well'), to exclude from the frequencies the number of cases in which words were used with meanings not significant or not relevant to our investigation. Furthermore, we separated the frequency of words that, still having the same linguistic form, had different meanings in the Italian language (i.e. 'sentire' with the meaning of 'feel' and 'hear

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on the phone'). The frequency of words with similar meaning was finally added (ie 'amiche' (female friends), 'amici' (male friends)).
We started by creating two categories of words that were especially interesting for our research: terms referring to the COVID-19 pandemic (ie lockdown, quarantine, pandemic, restrictions) and words alluding to type 1 diabetes (ie insulin, glycemia, hypo/hyperglycemia). Relative frequencies of words included in the categories 'COVID-19' and 'T1D', respectively, were compared by t-test. The analysis was performed through IBM SPSS Statistics 28.
Reflexive thematic analysis of integral transcripts was performed using the six-stage process of Braun and Clarke [18], consistent with our interest in in-depth insight into the experience of adolescents. Two independent researchers (A.D. and M.T.) conducted the thematic analysis focusing on what was personally meaningful to participants.
The findings were interpreted within the context of the existing literature.

3. Results

2.3. Word frequency analysis

Word frequency analysis was carried out. The ten most frequent words in adolescents' narratives include 'friends', 'home', 'before (COVID-19)', 'time', 'feel', 'to meet', 'glycemia', 'together', 'great' and 'to miss'.
Specifically, 'home' occurs one-quarter of the time together with the verbs 'to stay' / 'to be' or with the adjective 'shut'. 'Time' occurs in one third of the repetition with the meaning of 'more time to'. The adjective 'great' appears almost exclusively in the transcripts of the last focus groups, mostly related to 'back to normality'. 'Family', only 20th in frequency, reaches a number of repetitions equal to 'friends' by aggregating references to various members of the family (that is, 'mom', 'dad', 'parents'). 'Friends' appears, regardless of gender, as the most frequently used word, followed by 'home'. Compared to male participants, female adolescents use "glycemia", "tough" and "lonely" more frequently. Compared to their female peers, male adolescents recur more frequently with the verb "to meet" and with words that refer to physical proximity (that is, "physical contact", "to hug", "to be next to").
Figure 1 graphically illustrates the 100 most frequent words in the narratives of adolescents.
Among our participants, words referring to COVID-19 (that is, 'lockdown', 'social distancing', 'to get sick with COVID-19') are, on average, more frequent compared to words referring to T1D (that is, 'glycemia', 'diabetes', 'insulin') ([t23 = 1.98, $p < .05$]; MCOVID-19 = 6.33; SDCOVID-19 = 4.04; MT1D = 4.34; SDT1D = 5.61).

3.2. Thematic analysis

Seven main themes were identified: (1) COVID-19 and T1D; (2) emotional reactions to the COVID-19 pandemic; (3) changes in daily life; (4) feelings of loss; (5) coping with the COVID-19 pandemic; (6) the COVID-19 pandemic as an opportunity; (7) return to (new) normality. Figure 2 graphically illustrates the emergent themes and relative connections.
A complete description of the main and subtheme, including illustrative quotes, is presented below.

Figure 1. *Top 100 most referred words in adolescents' narratives.*

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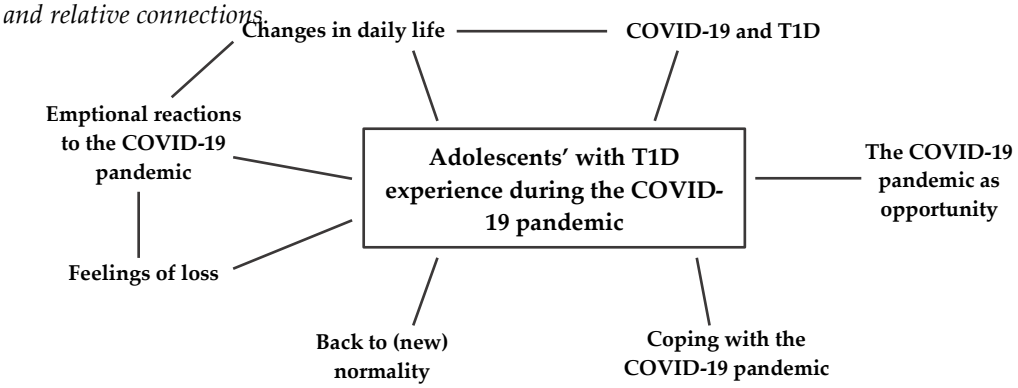
Figure 2. *The theme emerged and relative connections.*



3.2.1. COVID-19 and T1D

This theme describes the impact of COVID-19-related changes in daily routines on the management of type 1 diabetes. Implications of potentially belonging to a COVID-19 risk group are discussed.

In our sample, 33% of participants reported improved glycemic control during the COVID-19 pandemic. Our data identify several aspects that have contributed to improve diabetes-related metrics: (1) more time for self-care, with more regular blood glucose monitoring and insulin administration; (2) healthier home-cooked meals; (3) slower, less unpredictable routines; (4) better sleep quality, with the promptest night glycemia corrections. In our sample, boredom increased the frequency of blood glucose tests.

R. (male, 16 years old)*: [...] Glycemia slightly improved during the pandemic, I think because my routine has become much more monotonous. I was at home and had plenty of time to check my glycemia, even just because I was bored. Before the pandemic, I used to spend a lot of time outside and honestly I didn't check my insulin pump very often, while at home, with a healthier diet and more time, my glycemia improved.*

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Excessive attention to glycemic values, precipitated by the temporary need to self-manage T1D during the COVID-19 positivity period of her caregiver, is evident in the narratives of one participant.

E. (female, 18 years old)*: [...] I became obsessed with my metrics. In May, my mother got sick with COVID-19 and I had to start getting by myself. Glycemia has dropped. This made me happy, admitting, but I felt it was becoming more risky. [...] Now it annoys me to see even 200 (blood sugar level). I used to pay much attention to glycemic values even before, but now I do. I think being stuck at home didn't help me.*

Worse glycemic outcomes were reported by 25% of our cohort reported the worst glycemic outcomes and were casually attributed to (1) restrictions to physical activity (that is, sport, walks), (2) increased food intake, (3) continued need to adapt T1D therapy, strongly sensitive to changes in routines, to different phases of the emergency COVID-19, with variable restrictions in place and activities allowed, and (4) loss of motivation and difficulty continuing self-care and adhering to T1D therapy, given the circumstances.

L. (male, 18 years old)*: [...] At the onset of COVID-19, my routine changed completely. The glucose went wrong because I was much more sedentary. I had to change my parameters (therapy). During the summer period, there were many more activities allowed and I had to change the parameters again. Then we went home. Now, the parameters have changed again! I think it is true that having fewer appointments, days are more pleasant and you have more time to keep glycemia under control. Even just to pass the time, you put more effort into it. However, it cannot be denied that having to stay home does not help therapy much.*

In our sample, adolescents with T1D did not consider themselves at higher risk of a severe course of COVID-19 infection, when adhering to restrictions. Being considered 'frail' was negatively perceived by some participants, while others highlighted its advantages (ie, receiving COVID-19 vaccination earlier during the pandemic).
Among our patients, few concerns about getting sick with COVID-19 were reported, but concerns about the health of loved ones (that is, grandparents) and the possibility of transmitting COVID-19 were expressed more frequently.
In no cases, the Sars-CoV-2 virus appears to have led to greater attention to health among adolescents with T1D, similar to what our patients hypothesized for their healthy peers.

3.2.2. Emotional reactions to the COVID-19 pandemic

This theme explores the emotional experience of adolescents during the COVID-19 pandemic, mainly between February 2020 and April 2021.
Most adolescents (78%) described intense and difficult feelings, commonly including sadness, loneliness, frustration, anger, worry, and / or emptiness. Intense and difficult feelings were basically attributed to home confinement, to the inability to maintain usual activities and relationships.

E. (female, 18 years old)*: [...] During the lockdown, I cried many times, for a long time. It had never happened to me before. I was stressed and alone at home. I felt much more lonely.*
A. (female, 18 years old)*: [...] I was scared that something bad could happen to my grandparents. During the first lockdown, people died alone. I was very worried that this would happen to them.*

Symptoms of emotional numbness (that is, feeling detached from others, not having access to emotions) are traceable in the narratives of two male adolescents.

L. (male, 17 years old)*: [...] It was a very stressful time. I found that, I don't like to say that, I can be very mean. Some bad things happened and I couldn't be sad, I didn't feel anything at that moment. I didn't feel anything.*

The emotional state of the participants changed over time, worsening between the first (February- March 2020) and the second pandemic wave (October-November 2020), with

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an improvement during summer 2020 and in the months preceding the diabetes camp (July 2021), considered the best of the last year and a half, given the recovery of social life.
In our sample, the experience of intense and difficult emotions appears to be more frequent among older adolescents. A positive adaptation emerges among male participants with six adolescents referring to that they felt the most comfortable during the first year and a half of the COVID-19 pandemic.

3.2.3. Changes in daily life

Most of the participants (56%) referred to substantial changes in daily life, including being home confined, having parents more present, taking new necessary precautions (ie masks, social distancing, need to pay more attention) and distant learning. Participants considered the online school boring and stressful. Adolescents were disappointed by too much homework and a lack of acceptance of their concerns and emotions related to COVID-19.

***E. (female, 18 years old)**: [...] Teachers were not that kind of people. School definitely put extra pressure on me.*

Two participants disclosed changes in sleep/wake rhythm in an attempt to ensure greater privacy in shared domestic space.
Participants referred to the quarantine period as "boring" and "burdensome" with days blurring together and few specific memories to mark time.

3.2.4. Feelings of loss

Almost all of the participants shared feelings of loss. In particular, 78% of adolescents reported losing leisure activities and experiences such as spending time with family and friends, traveling, or "being simply an adolescent".

***R. (male, 16 years old)**: [...] During the last year, I should have grown, changed, and had certain experiences, but I think I have only grown physically. I found myself growing up as I had never considered before.*

Some participants (22%, mostly women adolescents) highlighted the weakening or loss of some friendship relationships, with a better selection of the truest friends. Loss of physical closeness is common in 33% of patients' narratives (mostly male participants).
Broader feelings of loss such as loss of freedom, motivation, interest, privacy, or time were furthermore described.

***F. (male, 18 years old)**: [...] What bothers me the most is the time we lost. It is still one and a half years of things we could have done but did not!*

3.2.5. Coping with the COVID-19 pandemic

The participants described a conscious effort to cheer themselves up and make the most of the situation. Self-care and coping strategies adopted included learning new things, trying to maintain a positive attitude (i.e., focus on things to be grateful for), participating in pleasant activities (i.e. spending time with pets, cooking together, playing games), or regularly exercising.
For most participants (54%) keeping in touch with friends and family through technology made the first year of the COVID-19 pandemic easier to cope with. However, technology was only considered partially satisfactory, not replacing in-person relationships, thus being associated for some participants with feeling socially disconnected or with the conscious decision to limit distance interactions.

***F. (male, 18 years old)**: [...] I love physical contact. I like to hug my friends, stay close, and laugh together. I don't like to hear my friends on the phone. Even during quarantine, I didn't use the*

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phone that much because hearing my friends only through messages bothered me. Thus, I closed a bit.

The adaptation of the situation became more difficult with time, particularly during the second wave of COVID-19 (October 2020), when the adoption of differentiated containment measures based on the epidemiological risk of the areas required adaptation to rapidly changing life contexts.

***R. (male, 16 years old)**: [...] After the first quarantine, I was very hopeful. It was summer, therefore, with the sun, hot weather and longer days, it was easier to stay positive. This year, I think I only went ahead out of inertia because we spent every other week locked up at home. There was no time to get used to and figure out what was happening next.*

3.2.6. COVID-19 pandemic as an opportunity

Most of the adolescents (79%) identified some positives in the COVID-19 pandemic. This included more time to self-dedicate, opportunities for self-exploration, and personal growth (37%).

***G. (male, 17 years old)**: [...] I tried to get to know and improve myself. I learned to feel good about myself, without needing someone.*

After home confinement and social isolation, adolescents (32%) reported more appreciated moments previously considered 'normal' (that is, spending time with loved ones), expressing their intention of fully enjoying them once they returned to normality.

***E. (female, 15 years old)**: [...] Something that used to be normal, that we underestimated and took for granted, like being all together or spending the whole day together, has no longer become something obvious. When I was at home, I learned that I have to enjoy the moments fully.*

Participants (48%) highlighted how lockdowns enabled them to strengthen and more appreciate their relationships, mainly within their household given more quality time spent together.

***B. (male, 16 years old)**: [...] Before COVID-19, I saw my dad for a few hours a day. Now that he is more at home, I have gotten to know him better. Let us say that I discovered his 'pixelated' side, he was always so precise with his work!*

3.2.7. Return to (new) normality

This theme describes how adolescents experienced their return to social life.

When asked what they first returned to doing once restrictions were eased, 63% of participants disclosed meeting their friends while 29% of their family members, mostly their grandparents. Most of the adolescents really enjoyed the first moments together.

***D. (male, 17 years old)**: [...] The first time I met my friends again was great! We went together to the Euganian hills, we talked and joked. It was an emotionally intense day. We were still there together, even after being apart for a long time.*
***C. (female, 18 years):** [...] When my grandma hugged me for the first time, I felt at home. I felt great, I missed her so much.*

Recovering for "lost time" by spending long days together was common among adolescents.

***R. (male, 16 years old)**: [...] We spent two full days together, going out all day, even in the evening. We made up for the lost time. It was great!*

Only in a few cases were the first social occasions experienced with initial concern and discomfort.

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R. (male, 16 years old)*: [...] At first, it was strange and I felt anxious, not for fear of getting sick with COVID-19, but because I hadn't had serious contact for months, except by phone. It seemed strange to me, a bit unnatural at first, but then the feeling of anxiety passed and it was a really good moment.*

Despite initial enthusiasm, participants (25%) expressed disappointment in the "new normality" where restrictions, although eased, and the virus spread, continued to condition the way of being together, feasible experiences or the possibility of fully enjoying them.

M. (male, 17 years old)*: [...] I went to the sushi restaurant with my friends and due to restrictions we couldn't sit at the same table and we had to split up. It was strange: we were happy to do this again together and then we were separated.*
E. (female, 17 years old)*: [...] My parents showed me photos of trips they took with friends when they were almost my age. Now you can travel, but it is not the same. Everything is more complicated! I think it's bad! With all those restrictions and checks, I don't feel like going, honestly, and it seems strange to me because kids should spend their summer differently.*

4. Discussion

This study aimed to explore the experience of the COVID-19 pandemic of a cohort of adolescents with type 1 diabetes, since previous quantitative studies highlighted better glycemic outcomes, but more frequent symptoms of anxiety and depression, in contrast to evidence of worse glycemic control in patients struggling with their mental health.
The word frequency analysis in adolescents' narratives identified 'friends', 'family' and 'home' as the most frequent terms, reasonably describing the most important issues in the experience of adolescents during the emergence of COVID-19: missing their friends, stuck at home, more family time, being together again.
The themes identified collectively capture how the COVID-19 pandemic was an intense and burdensome experience for youth, with unexpected changes in routines, difficult emotions, and important sacrifices, replicating existing qualitative evidence [19-23]. Loss (mainly from milestones and daily experiences of adolescence) is among the most represented topics in patient narratives, and participants note positive opportunities in the COVID-19 emergency. This seems to suggest that, despite difficulties, for adolescents who successfully managed a positive cognitive evaluation of the circumstances, the COVID-19 emergency represented an occasion for self-discovery, self-care, and more intimate relationships. Keeping in touch with friends and family, engaging in pleasant activities, family quality time, and positive thinking helped adolescents make the best of the situation.
Ambivalent feelings characterized the return to normality. Participants reported really enjoying returning to social life. However, disappointment with the 'new normality' where restrictions and virus circulation continued to condition youth' experiences and time spent together clearly arose. This seems to suggest that returning to normality, in addition to initial enthusiasm, was actually complex for adolescents. In our experience, this hypothesis appears to be validated by a consistent increase in psychological support requests among adolescents followed-up at the Pediatric Diabetes Unit (Padua) after restriction easing.

When comparing the themes that emerged for our sample with evidence for the general population of adolescents in previous qualitative studies, no particular focus emerged among our participants. This seems to confirm how type 1 diabetes has not determined the perception of increased health risk, greater isolation, or particular adherence to restrictions, replicating Zeiler et al. [12] and suggesting our cohort's experience being globally assimilable to that of the general population of adolescents.
When considering the specificities of our cohort, aspects that could influence the adherence to treatment and glycemic control were identified according to the point of view of the adolescents, which confirms some of the hypotheses advanced in the diabetes literature early during the pandemic. Slowed routines and more time for self-care were associated

 doi:10.20944/preprints202212.0578.v1

with better glycemic control. Having to repeatedly adjust T1D therapy to different phases of the pandemic, with variable activities allowed, was associated with suboptimal diabetes-related outcomes. Furthermore, worse glycemic metrics were attributed to loss of motivation to self-care, given the circumstances, consistent with the evidence of suboptimal glycemic control among patients with worse mental health. For our sample, there is no evidence of greater involvement of caregivers in the management of PD1 during the emergency.

In our cohort, intense and difficult emotions emerged in a wide range of emotions. Although such emotional reactions could be normal under the circumstances and prove temporary, action would be desirable. In our experience, narrating one's own experience during the COVID-19 pandemic within the peer group helped normalize and highlight the universality of worries and emotions experienced in response to drastic and abrupt changes in adolescents' developmental context, promoting support perception among patients. Furthermore, the participation in focus groups allowed the health care team to immediately intercept and prevent discomfort, but also a cohort of adolescents, sensitized to the importance of mental health care, to directly ask for support and report their symptoms. This had consistent implications on treatment motivation. We find interesting evidence that 21% of campers directly requested psychological support in the months following participation in focus groups.

4.1. Strengths and limitations

To our knowledge, our study is among the first qualitative investigations investigating adolescents with experience with T1D during the COVID-19 pandemic, not limiting itself to the possible impact of the emergency on the treatment of T1D and considering a broad time frame never explored before in the literature.

However, our research has some limitations, mostly concerning sample composition and the moment of data collection. Our sample is gender-inhomogeneous, mostly including male participants, with mainly patients experienced in diabetes management diagnosed for more than five years. We hypothesize that aspects more closely related to the impact of the COVID-19 pandemic on T1D may emerge by including more patients with recent diabetes onset.

The focus groups were led by two different psychologists with potentially different conduction styles. Inevitably, different group dynamics arose between participants. Despite the effort of the moderators to involve all participants, the experience of more introverted adolescents may have been less represented. Similarly, adolescents who had a more difficult time taking care of themselves during the COVID-19 pandemic may have had less intention to share their experiences. Narratives related to the initial period of the COVID-19 emergency may have been affected by the time interval between the onset of the pandemic (February 2020) and the moment of data collection (July 2021), given the difficulty in marking the pandemic period, highlighted by the participants themselves. Focus groups were held during the evening hours of the diabetes camp, therefore, the participants could have been tired and less concentrated.

5. Conclusions

Taken together, our data suggest that the COVID-19 pandemic may have represented a more stressful condition for adolescents with DD1, given the need to maintain adequate glycemic control in the face of sudden and drastic changes in routines, in addition to the consequences of the emergency already highlighted for the general population of adolescents. Being sensitive to mental health importance, easy access to psychological support, and some T1D management skills (planning, frustration tolerance, dealing with the unexpected) may have been protective and facilitated our cohort of adolescents with T1D in stress management and adaptation to emergency.

Our findings confirm the influence of psychosocial factors on the management of TD and suggest the importance of supporting youth in a positive cognitive evaluation,

providing useful directions to the pediatric diabetes team to promote adolescents' psychorelational well-being and to support pediatric patients in reaching adequate glycemic control while pandemic consequences on youth health continue.

Authors Contributions: Conceptualization, MC, ANM, ER and C.M.; methodology, MT, MC and A.N.; formal analysis, MC and A.D.; investigation, MC and A.N.; data curation, A.D.; writing—original draft preparation, AD and M.C.; writing—review and editing, MT, MC, AN and E.R.; supervision, MC and MTC. All authors have read and agreed to the published version of the manuscript.

Funding: This research did not receive external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study and their parents.

Conflicts of Interest: The authors declare that they have no conflict of interest.

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