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Improved Self-Management in People with Type 1 Diabetes: A Qualitative Study of Sense of Coherence in Daily Life One Year after the First COVID-19 Lockdown in Denmark

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Abstract: During the first lockdown of the COVID-19 pandemic, people with type 1 diabetes (T1D) were worried, stressed, and experienced changes in their self-management practices. Studies found that many had difficulties managing their disease, while others showed improvements. Since the first lockdown, the virus and subsequent lockdowns have become a more regular part of everyday life. The present study investigated how the COVID-19 pandemic, one year after its outbreak, has affected self-management in people with T1D. The dataset consisted of seven semi-structured interviews with adults with T1D, which were interpreted using Antonovsky's theory of Sense of Coherence (SOC). We found that the pandemic and the ensuing lockdowns had contributed to better self-management in people with T1D, as they had developed a strong SOC. Knowledge from healthcare professionals and their own experiences with the COVID-19 pandemic had caused them to experience stronger *comprehensibility*, which had been crucial to experiencing strong *manageability*, enabling them to make active choices to maintain good glycemic control. Furthermore, better opportunities and more motivation had allowed them to experience stronger *meaningfulness* regarding immersing themselves in their treatment. Our findings show that, during health crises, having a strong SOC is important for disease management among people with T1D.

Keywords: COVID-19; type 1 diabetes; self-management; sense of coherence; qualitative research



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1. Introduction

On 11 March 2020, the World Health Organization declared the spread of COVID-19 a global pandemic, and on the same day, the Danish Prime Minister's Office declared a lockdown in Denmark [1,2]. At the beginning of the first lockdown, the Danish Health Authorities declared people with diabetes a group at high risk of becoming seriously ill if infected with COVID-19. However, there were unclear announcements concerning whether this applied to all types of diabetes and whether other factors were important in relation to becoming seriously ill [3]. For individuals with type 1 diabetes (T1D), there were uncertainties regarding their risk status during the first lockdown in Denmark. Studies showed that they were worried about becoming seriously ill and not being able to control the disease [4,5].

Lockdown in Denmark introduced several changes in everyday life, as it included the closing of workplaces, fitness centers, nightclubs, and a ban on gatherings [6]. It is well known that changes in the daily routines of people with T1D can have an impact on self-management practices [7]. Maintaining good glycemic control is a central and important part of diabetes management, the goal of which is to avoid diabetes-related complications [8].

During the first lockdowns of the pandemic, people with T1D experienced changes in their self-management practices. However, there were discrepant results regarding these changes. Some studies found that people with T1D experienced a disruption in their daily diabetes tasks, which were primarily centered around physical activity and food intake [9,10]. Although some had tried to adapt their self-management practices to a new kind of daily life, adaptation had been difficult. These changes, along with higher levels of stress and frustration, made it difficult to achieve good glycemic control [10–12], and one study reported a worsening of glycemic control in people with T1D [9]. On the other hand, a study found that some people with T1D reported that lockdown had made self-management easier [12]. Furthermore, improvements in glycemic control among people with T1D during the first lockdown have been reported in several studies, suggesting that having more time for self-management may be the reason for this improvement [13–17].

When people are exposed to stressors such as the COVID-19 pandemic, the concept of Sense of Coherence (SOC) can be used to highlight and explain why and how some individuals can cope with stress and manage to stay healthy, while others cannot [18]. Consequently, studies have investigated the relationship between SOC and quality of life, mental health, and fear of the virus in relation to the pandemic [19–21]. Nevertheless, no studies to date have specifically investigated SOC and self-management among people with T1D in relation to the pandemic. SOC can be used to explain why some people with T1D manage to achieve good self-management practices, while others find it challenging.

Since the first lockdown, the COVID-19 pandemic in Denmark has evolved with a gradual reopening of society followed by a partial lockdown and then full lockdowns [22,23]. In December 2020, a vaccination program started in Denmark, which was to be rolled out until the summer of 2021 in order of priority [24]. Additionally, more exact knowledge has been generated about what being in a risk group means for people with T1D [25]. Therefore, the body of knowledge is not as incomplete as it was during the first lockdown.

Knowledge about how the pandemic was affecting self-management one year after the outbreak is sparse. Since the first lockdown in Denmark, the virus and lockdowns have become a more regular part of their daily lives. Therefore, the situation in Denmark in March 2021 (for people with T1D) differed from the situation during the first lockdown. Hence, in the present study, we investigate how the COVID-19 pandemic, a year after its outbreak, affected self-management in people with T1D. The aim of the study is to explore: (1) how people with T1D experienced their own ability to manage their disease in March 2021 and (2) how the pandemic and the second lockdown affected self-management routines among people with T1D in March 2021.

2. Methods

2.1. Design

We chose to apply a qualitative approach with a distinct focus on individuals' experiences, perceptions, and thoughts, enabling us to understand how people with T1D have experienced their own ability to manage their disease, and how the COVID-19 pandemic and the ensuing lockdowns have affected this ability. We performed this by applying central concepts from Aaron Antonovsky's theory "Sense of Coherence".

2.2. Participants

Eight adults with T1D were interviewed (see Table 1 for characteristics). We initially chose to contact eight people with T1D, who had previously participated in a similar study in April 2020 regarding their experiences during the first COVID-19 lockdown [5,10]. The study, which included adults with T1D and type 2 diabetes (T2D), found significant differences between the way interviewees with T1D and T2D had performed their daily self-management practices: The interviewees with T1D experienced a disruption regarding their self-management practices and were more challenged in managing their disease, while those with T2D had continued their usual everyday life [5,10]. As the differences between the two groups were so significant, it would not be sensible to include both

groups in one study, and we, therefore, chose only to include the ones with T1D to explore the self-management practices specific to T1D. These participants were initially recruited through two user panels at a major diabetes hospital in Denmark and the Danish Diabetes Association. The panels consist of people with diabetes from different primary and/or secondary care settings who have volunteered to share information about their lives with diabetes. In connection with their participation in April 2020, they gave permission to be contacted again regarding participation in a similar study.

Table 1. Study population.

Gender	Age (Mean 27.3)	Diabetes Duration in Years (Mean 15.4)	Educational Level	Race/Nationality
Male	21	2.5	Finished upper secondary school	White/Danish
Male	23	13	Secondary vocational education	White/Danish
Female	24	12	Tertiary education	White/Danish
Female	25	7	Tertiary education	White/Danish
Female	26	17	Tertiary education	White/Danish
Female	27	22	Tertiary education	White/Danish
Female	45	34	Secondary vocational education	White/Danish
Female *	50	48.5	Tertiary education	White/Danish

* Participant eliminated owing to extraordinary circumstances and excluded in calculations

For the present study, the participants were contacted by phone, and all agreed to participate. Just before the interviews, one of the participants withdrew from the study. Furthermore, one of the participants appeared to be so strongly affected by the grief of having lost a close relative, that this completely dominated the interview to a degree, where the roles of the pandemic and the lockdown were unclear. We therefore decided not to use this interview. When a total of 6 applicable interviews had been conducted, we concluded that the level of information power and data saturation in the data was not quite acceptable [26,27]. For this reason, we decided to recruit an 8th informant who had not participated in the interviews in April 2020. Because the present study is not a direct follow-up to the interviews conducted in April 2020, we concluded that it would not have an impact on our results. Regarding the COVID-19 situation in Denmark, it is important to note that none of the participants were fully vaccinated at the time of the interviews and only one was partially vaccinated.

2.3. Data Collection and Procedure

Semi-structured interviews were conducted over the course of one week in March 2021; their average length was 35 min. Due to lockdown and the need for social distancing, the interviews were conducted as phone or video interviews. The interview guide was developed by the entire research team and consisted of four main themes: (1) diabetes and COVID-19: with questions focusing on perceptions of being in a risk group, changes in daily life, and blood glucose regulation; (2) diabetes management: with questions focusing on changes in exercise, diet, symptoms, and whether the pandemic has had positive or negative consequences for self-management; (3) psychosocial consequences: with questions focusing on worries related to COVID-19 and on perceptions of general well-being; and (4) support and diabetes: with questions focusing on information from health authorities and support-needs.

After each interview, the research team discussed and systematically wrote down the overarching themes that were touched upon in the interview. When a total of 7 applicable interviews had been conducted, and no overarching themes had emerged in the two latest interviews, we concluded that the level of information power and data saturation was acceptable [26,27]. Although the sample size was relatively small, the design and

theoretically explorative nature of our study mean that it was deemed suitable for analysis and publication. This is in line with methodological literature on the subject concluding that even very small sample sizes can be highly informative and meaningful if the research adheres to expected standards of qualitative studies [28].

All interviews were conducted by two authors (KZM, ASR) and were digitally recorded and transcribed verbatim. None of the researchers had any prior relationship with any of the interviewees. The participants were informed about the purpose of the study and their personal rights as research subjects. All participants gave their informed consent. The study was approved by the Danish Data Protection Agency (P-2020-271) and carried out in accordance with the Declaration of Helsinki.

2.4. Data Analysis

The data were analyzed using thematic analysis, as described by Braun and Clarke [27]. Themes were derived using an inductive approach with a focus on personal experiences with diabetes self-management. In Phase 1, we formed an overall impression of the data by listening to, reading, and rereading the data. In addition, we began making notes with ideas for coding. In Phase 2, we organized the data into meaningful groups by producing initial codes from the data. In Phase 3, we classified the initial codes into overarching themes by using a thematic map. In this phase, we started to organize our data by looking at the relationship between codes, between themes, and between different levels of themes. In Phase 4 and 5, we reviewed and refined the data extracts in relation to coherence within the themes and organized them into final main themes. During each phase, all authors took part in the discussion, and a consensus was reached regarding the final main themes. The analysis made it clear that the participants had used coping strategies throughout the COVID-19 pandemic to manage their disease. Therefore, we found it relevant to use SOC to interpret the findings. Thus, the first part of our results section is a thematic presentation followed by an interpretative presentation, where we apply SOC.

3. Results

3.1. Thematic Results

3.1.1. Knowledge and Experience Make the Person with Diabetes Feel Less Worried

Several of the interviewees described how they were confused and worried during the first lockdown due to unclear information about how they should think about their own risk of becoming seriously ill. One year after the outbreak of the pandemic, all the interviewees described feeling less like they were part of a risk group and less worried about COVID-19, as they had gained a better understanding of what it means to be in a risk group. This was mainly due to the knowledge they had been provided by professionals and their own experiences with the COVID-19 pandemic. Being reassured by their own nurses and doctors that they were no longer in danger if they were well-regulated had a significant impact on several of the interviewees:

“I definitely have fewer worries today, than I had in the beginning [. . .] It’s been reassuring that there has been more focus on what it means to be in a risk group, and it’s been nice to come out and talk to nurses and doctors and know that I’m well-regulated. I’m not in any particular danger” (Male, 21 years).

Another interviewee felt that the information about her diabetes and the pandemic she had received from her nurses and doctors was limited. Instead, she gained knowledge through a colleague working in diabetes research, and this knowledge helped her stop believing in the scare images spread by the media:

“It gave me a lot of peace to hear her (i.e., colleague) deny all these wild stories. It helped me a lot, and that’s because I trust her and respect her [. . .] If I had not gotten her to clarify some of those things, I would still believe it” (Female, 27 years).

For them, having gained a better understanding of how to think about their own risk was crucial, because it led to a feeling of reassurance and certainty. Furthermore, it was important that this reassurance came from someone they trusted (i.e., their nurses and doctors). However, even though the interviewees had gained a better understanding of how to think about their own risk, several of them mentioned feeling a lack of information and support from their nurses and doctors. As this interviewee mentioned, the information from his nurses and doctors was received late:

“It has been nice to get a clarification, but I just think that clarification came a little late” (Male, 21 years).

Additionally, some of the interviewees had experienced the COVID-19 pandemic through other people with T1D, which made them feel less worried. One of the interviewees, who was very worried at the beginning of the pandemic, had allowed herself to relax more by talking to other people with T1D:

“There were some of them who actually went to work, and I was like, “How can you!” So I think that also had some effect on me: “Ok, now I can relax a little more. I don’t have to be so hysterical”” (Female, 24 years).

Hearing and seeing that other people with T1D went to work and were more relaxed, even though they were in a risk group, left a strong impression on this interviewee and made her feel less worried. Likewise, some had discovered that the scare stories spread by the media and the information they received at the beginning of the pandemic did not match the reality they saw:

“I read some articles saying that there was a three times greater risk of dying if you have diabetes and get infected with Corona [...] So at the beginning of Corona I thought: “Shit, this is going to hurt!” [...] but it hasn’t happened” (Female, 27 years).

Overall, the interviewees felt less like they were part of a risk group and less worried about COVID-19 than they had at the beginning of the COVID-19 pandemic. The knowledge they had accumulated from health professionals and their own experiences with the pandemic had given them a better understanding of how to think about themselves as belonging to a risk group. In that way, they had changed their own risk perception, as they no longer considered themselves to be in any particular danger of dying or getting seriously ill, which had helped to reassure them. However, even though they all had gained a better understanding, they felt a lack of information from their nurses and doctors, who are the people they trust.

3.1.2. Active Choices to Maintain Good Glycemic Control

The interviewees described how the first lockdown had affected their mental well-being and decreased their physical activity level, which consequently had a negative impact on their ability to manage their disease and maintain good glycemic control. Thus, many of the interviewees had chosen to focus on their mental well-being and increase their physical activity level during the COVID-19 pandemic. For the interviewees who had increased their focus on how they felt mentally, this was especially because of the negative effect the first lockdown had on their state of mind and blood glucose:

“Maybe it has been stressful (i.e., the body) in some way in the beginning because I don’t see the same spikes in my blood glucose as I did at first. We were told all the time to be afraid [...] How I feel mentally affects it (i.e., blood glucose) at least as much. If you’re in a really good period mentally, then you typically also eat healthy and exercise and all those things” (Female, 27 years).

“But your mind, you have to take really good care of your mental health [...] Because otherwise it also affects your disease and your diabetes or whatever is wrong with you.” (Female, 45 years).

For these interviewees, it was important to minimize feelings of stress and loneliness so they could take better care of their mental well-being, although media exposure and lockdowns made it difficult for them. To minimize those feelings, they had stopped following the news or tried to keep themselves busy:

“After all the worst-case scenarios that were presented in the beginning, I stopped following the news. I just felt like it was getting to be too much for me. So, I stopped reading about the research that came out” (Female, 27 years).

“I may have a bad day now and then, but it’s very, very rare. I find something to do, so I don’t have too much time to sit and think about how lonely it can be” (Female, 45 years).

In this way, the interviewees have managed to take responsibility for their own disease through the COVID-19 pandemic by making some active choices to sustain good mental health, thereby giving themselves the best opportunities for self-management. Whereas some have focused on their mental well-being, almost all interviewees have prioritized their physical activity level to maintain good glycemic control. Several of the interviewees have managed to compensate for the physical activities they were no longer able to do, whereas some have increased their level of physical activity. Due to lockdowns, some of the places the interviewees typically exercised had been shut down, but they found new exercise habits:

“Football had been shut down for a short while, but then I started cycling, so it hasn’t affected my blood glucose” (Male, 23 years).

For several of the interviewees, it was particularly the experiences they had during the first lockdown that had caused them to change their strategy to remain physically active. One of the female interviewees described how a lower level of physical activity during the first lockdown had forced her to adjust her insulin pump. She did not want to do that, so she made some other changes instead, allowing her to better control her blood glucose:

“But it has required some actions [. . .] Then I was like, “Oh, I won’t that, then I must find another way. Then I have to go out and get started.” I started walking a lot due to Corona, and it has also helped me” (Female, 25 years).

In addition, some of the interviewees had increased their level of exercise, as they felt restless or felt they needed to keep themselves going during lockdown periods:

“So because I’ve felt so restless from being at home, I’ve started running, for example. I wouldn’t have done that if not for the Corona lockdown [. . .] But it’s because I wanted to keep going. I was locked up here at home” (Female, 25 years).

As well as feeling restless, some of the interviewees emphasized that the lockdowns had given them better opportunities to integrate exercise into their everyday life. For example, one female interviewee reported that she now exercises more than before the COVID-19 pandemic:

“It (i.e., exercise) might have gotten better because I do it more intensely. I do it as a plan to do something. Maybe I didn’t think much about that before, I just did something. So, it’s more strategic that I exercise and exercise more than just going for a walk” (Female, 45 years).

Overall, most of the interviewees described having good conditions for managing their diabetes. By focusing on how they felt mentally and by creating new exercise habits, they have managed to maintain or even improve self-management during the COVID-19 pandemic, even though they found it difficult at the beginning.

3.1.3. Time to Immerse and Fewer Unhealthy Temptations

Overall, several of the interviewees described how the COVID-19 pandemic had provided better opportunities for them to regulate their blood glucose, emphasizing that

they were better regulated today than before the COVID-19 pandemic. Due to lockdowns and restrictions, they experienced having more time to focus on their treatment and that having fewer temptations, especially on the weekends, made treatment easier.

Furthermore, the fact that they were in a risk group and wanted to stay well-regulated made them take better care of their diabetes. The pandemic and the ensuing lockdowns had given them more time to go in-depth with their treatment, which can often be difficult in the context of a stressful everyday life:

“I had more time to either have a bad conscience about having too high blood glucose or more time to find out what this oatmeal actually does to my blood glucose, when I need to take some more insulin, and so on. So, in that way, I had time to go a little more in-depth with the treatment, which you don’t have time for in everyday life” (Female, 24 years).

In that way, the COVID-19 pandemic has contributed to a less stressful everyday life, which has given the interviewees time to have a bad conscience, when blood glucose levels are high, but also more time to gain a better understanding of their diabetes and to be more careful with treatment.

For this male interviewee, the extra amount of time in everyday life and the fact that he still perceived himself as a part of a risk group allowed him to be more careful with his blood glucose:

“There has not really been much else I can do, so it’s become a sport to make my blood glucose look good, especially when you, not because I am particularly scared, but when you’re in a risk group, then it’s just nice to know that your blood glucose is as it should be [. . .] I handle it a little more industriously and I’m stricter with it, than I was before Corona” (Male, 21 years).

Some of the interviewees described how the COVID-19 pandemic had made it easier for them to regulate their blood glucose on the weekends, as there were no longer temptations in the form of alcohol and parties. For one of the male interviewees, the fact that he no longer went out drinking on the weekends and no longer ate junk food the day after had a positive impact on his general well-being and blood glucose:

“It’s a completely different world [. . .] both on the blood glucose, but also in my head. Much fresher, not so teenage-lazy” (Male, 23 years).

Under normal circumstances, maintaining good glycemic control was something the interviewees found difficult during the weekends. Being part of an alcohol culture, where it is normal to drink when you are socializing with your friends, was perceived as challenging when you have a chronic disease such as diabetes:

“The culture we have today with young people, there is quite a lot of alcohol, and I think it’s quite difficult to know how much insulin I need to take to keep my blood glucose levels looking good when I drink. So, alcohol has just been taken out of the equation, since you can’t really go clubbing or party that much” (Male, 21 years).

All the interviewees mentioned that the COVID-19 pandemic had negative consequences in the form of social distancing from families and friends, closure of workplaces, etc., but they were all aware that the pandemic had a positive effect on their diabetes. Even though they were all stressed and afraid at the beginning of the pandemic and had trouble managing their diabetes in different ways, they have experienced that the pandemic has also had an opposite and positive effect:

“I was actually a little scared when they started shutting down, so I thought: “This is not going well, oh no, it’s going to be awful,” but it’s like it worked the opposite way [. . .] I can see that it’s okay. I take a bit better care of it, and my long-term tests are falling and falling” (Female, 25 years).

Overall, the COVID-19 pandemic gave several of the interviewees more time in everyday life to focus on their diabetes and, thus, better opportunities for self-management. The extra amount of time, fewer temptations, and the desire to stay well-regulated motivated them to take better care of their diabetes. Hence, self-management had in some way become their number one priority in everyday life.

3.2. Interpreted Results

In the present analysis, we adopt central components of the theory of SOC. According to the theory, the main factor determining how a person manages to achieve good health despite their exposure to stress depends on whether the person has strongly experienced three components that are inextricably linked to each other: *comprehensibility*, *manageability*, and *meaningfulness* [18]. Our thematic analysis showed that all interviewees tended to refer to the first lockdown, where they described being stressed and having difficulties managing their diabetes. Nevertheless, they had all been able to maintain or even improve self-management a year after the outbreak of the COVID-19 pandemic.

Therefore, we use the three components to understand how and why the COVID-19 pandemic has improved the interviewees' ability to manage their disease, and in that way, how they have managed to achieve good health despite their exposure to stress.

Comprehensibility refers to the extent to which an individual perceives challenges or events as either pleasant or stressful. If you have a strong experience of comprehensibility, you perceive them as structured, predictable, and comprehensible. Otherwise, if you have a weak experience of comprehensibility, you perceive them as chaotic and inexplicable, and therefore more stressful [18]. Our first theme showed that several of the interviewees had gained a greater understanding and, thus, a new perception of themselves as part of a risk group. The knowledge they had been provided by health professionals they trusted and the experiences they had with the COVID-19 pandemic had caused them to feel calmer and more relaxed, instead of stressed, worried, and confused.

According to the theory of SOC, these interviewees have had a stronger experience of comprehensibility, as they now perceive their own risk to be more predictable, instead of chaotic and inexplicable, and thus less stressful. For the person with a strong experience of comprehensibility, challenges or events are seen as things they can cope with, which is crucial to finding the resources needed (i.e., *manageability*) to manage them [18]. Due to the experience of stronger comprehensibility, the interviewees could see the COVID-19 pandemic as a challenge they could cope with, which allowed them to experience manageability.

Manageability refers to the extent to which an individual perceives having the available resources (i.e., skills, support) needed to meet the demands of the challenges or events. If you have a strong experience of manageability, you believe that things are manageable and within your control [18]. For several of the interviewees, the experience of comprehensibility had been an important factor enabling them to believe that they had sufficient skills to cope with and manage their diabetes through the pandemic. In that way, they had been able to focus on achieving good mental health and finding new exercise habits to maintain good glycemic control, which were goals they felt were within their control.

What seems to be very important is that the interviewees also strongly experienced meaningfulness, which is the motivating element of SOC. *Meaningfulness* is the central element of SOC, as motivation allows the person to find the resources needed to deal with the situation. If you have a strong experience of meaningfulness, you feel that things are worth becoming involved in and that there is a good reason to care about them, or a purpose in caring [18]. The experiences the interviewees had during the first lockdown, where they learned that their mental well-being and low level of physical activity affected their ability to manage their diabetes, motivated them to care about it and make some changes.

Likewise, the desire to stay well-regulated—to ensure they were not in particular danger of becoming seriously ill—motivated them to focus on self-management and maintain good glycemic control. Furthermore, lockdowns have given them better opportunities for self-management. The extra time and fewer temptations have motivated them to immerse

themselves in their treatment and take better care of their diabetes, as there were no longer other factors that could distract them in everyday life and on the weekends. In that way, the pandemic has given the interviewees a strong experience of meaningfulness, as they felt it was worth becoming involved in their diabetes and self-management practices.

Thus, the interviewees have gained a strong SOC during the COVID-19 pandemic, enabling them to improve self-management and achieve good health, despite their exposure to stress. What seems to be crucial is that the interviewees have experienced strong comprehensibility and meaningfulness, which, according to the theory, are the two most important components of SOC. Comprehensibility is important, because strong manageability is contingent on understanding. Meaningfulness is seen as the most crucial element, as without motivation, feelings of strong comprehensibility or manageability will only be temporary [18].

4. Discussion

In our study, we identified three highly interdependent themes of relevance to how the COVID-19 pandemic, one year after its outbreak, has affected self-management in people with T1D. These themes are strongly related to the three components of SOC: *comprehensibility*, *manageability*, and *meaningfulness*. Overall, our findings demonstrate that in some individuals with T1D, the pandemic has contributed to better self-management. According to our findings, the interviewees all gained a better understanding of how to think about their own risk (i.e., a stronger experience of comprehensibility), which had been crucial to them using their own resources (i.e., a strong experience of manageability) to maintain or even improve glycemic control. Furthermore, our findings show that, due to the extra time, fewer temptations, experiences from the first lockdown, and a desire to stay well-regulated, the pandemic had given them a generally stronger feeling of motivation (i.e., meaningfulness) to focus on self-management and, therefore, take better care of their diabetes.

Several other studies have investigated the impact of the pandemic on various diabetes parameters in people with T1D [9–17]. However, these studies investigated the early impacts of the pandemic, which makes our study, to the best of our knowledge, the first to undertake a qualitative exploration of how the COVID-19 pandemic has affected longer-term self-management in people with T1D.

Some of the studies found that lockdown made self-management for people with T1D more difficult. These challenges were due to sudden changes in daily routines and higher levels of stress caused by concerns and confusion related to being labelled as a risk group [10–12]. These findings, compared to our results, suggest that, at the beginning of the pandemic, some people with T1D had a weak experience of comprehensibility, which is exemplified when an individual perceives challenges or events as stressful [18]. Due to the unclear risk perceptions and concerns about becoming seriously ill, they perceived their own risk and the whole pandemic as chaotic and inexplicable (i.e., a weak experience of comprehensibility), which made the pandemic a stressful challenge.

The relationship between levels of stress and the degree of SOC in people with diabetes was investigated in a study by Cohen and Kanter [29]. Their study found that having a strong SOC was related to lower psychological distress and better glycemic control, indicating that psychological aspects such as stress are important to having a strong SOC and being able to manage the disease. Furthermore, it showed that healthcare professionals need to be aware of the psychological consequences of placing people with a chronic illness in a risk group without providing clear explanations, as such a placement can be very stressful and affect their ability to manage their disease.

Even though we found that the participants had gained a better understanding of how to think about their own risk (i.e., stronger experience of comprehensibility), some of them mentioned that the information from their nurses and doctors had been received late or had not been received at all. Additionally, several of the participants stressed the importance of the information coming from their nurses and doctors, whom they trusted,

which confirmed the results of Hirjaba et al. [30]. Their study showed that people with T1D find it very important that information and advice regarding their disease be provided by health professionals with expertise in diabetes and with whom they have a personal relationship. Furthermore, it is important that the information be adapted to them as individuals, as this promotes a sense of security and trust.

These findings, along with our results, suggest that health professionals have an important role to play in providing information and advice, especially during a health crisis such as the COVID-19 pandemic, which can be perceived as inexplicable and creates a sense of uncertainty. In our study, it was evident that receiving information from their nurses and doctors was crucial to having a stronger experience of comprehensibility and feeling calmer and more relaxed one year after the outbreak of the pandemic, as they are trustworthy and promote a sense of security. Thus, health professionals need to ensure that, in the future and in the event of a health crisis such as the COVID-19 pandemic, they provide individually tailored information in a timely manner to people with T1D, as it is important for people with chronic diseases to be able to manage their disease.

Other studies conducted during the first period of the pandemic have found that lockdown had a positive effect on self-management and glycemic control. Fisher et al. [12] found that some people with T1D reported that lockdown made self-management easier, but the study did not explain how and in what way it had become easier. Other studies have shown that people with T1D reported improvements in glycemic control in the short term, suggesting that more time for self-management may be the reason for this improvement [13–17]. In addition, Potier et al. [17] found that improvements in glycemic control was associated with an easier diabetes control perception along with positive lifestyle changes such as less alcohol intake and increased physical activity.

These findings are consistent with our results, as our findings demonstrate that in some individuals with T1D, the pandemic had improved self-management and self-reported glycemic control. In addition, we found that the extra time and fewer temptations resulting from the pandemic had given our interviewees greater motivation (i.e., meaningfulness) to focus on treatment and make some lifestyle changes, as there were no longer other factors that could steal their attention.

Studies have shown that living with T1D under normal circumstances can be a major challenge in daily life due to the many self-management practices required [31–33]. Making decisions about self-management can conflict with different competing preferences (i.e., social needs vs. medical needs) and can become an ongoing inner negotiation [34]. These decisions are especially challenging in stressful periods of life, where disease management can be given lower priority, and where it is difficult to find a balance between achieving good glycemic control and living a social life that includes parties and alcohol [32]. These findings are further supported in our study, as some of the participants mentioned that self-management was particularly challenging when they were busy doing other things or when they tried to fit into a culture that often included alcohol. Our findings indicate that living in a society with partial or full lockdowns makes it easier to live with T1D and balance focusing on self-management and engaging in social life.

We found that experiences from the first lockdown and a desire to stay well-regulated also contributed to a stronger feeling of motivation (i.e., meaningfulness) to improve self-management. In addition, we found that motivation was the most important element of feeling a strong SOC and improving self-management. The importance of motivation has been seen in other studies, showing that if people do not have inner motivation and do not believe that some self-management practices will have significant consequences for their health, or if they have difficulties assessing the effects of management, they may be less consistent in adhering to these practices [30,34,35].

These studies, along with our results, suggest that the pandemic has given the participants greater inner motivation to focus on self-management, because they have experienced the consequences and effects good disease management can have in relation to their health. Their experiences during the first lockdown, which showed them that changes in self-

management routines affected their ability to manage their disease, and the fact that they could be in particular danger if they were not well-regulated, made them more aware of the consequences and effects of self-management, and therefore more motivated to focus on it.

However, it is unknown whether this stronger feeling of motivation regarding self-management will continue throughout the pandemic, and on the other side of it. Several of the participants were aware of the positive effects the pandemic had on their diabetes, and as one of the interviewees mentioned, it was a “*completely different world*”. Audulv et al. [34] stated that if people experience health benefits by focusing on good self-management practices, they will be more motivated and consistent in their implementation.

Thus, our findings suggest that the participants have experienced a health benefit due to their improvements in self-management, and that this might motivate them to continue in the future. How health professionals can help them implement these positive improvements in self-management should be highlighted in future research and practice.

We found that the participants had gained a strong SOC during the pandemic, which had contributed to better self-management. Several other studies have investigated the relationship between a strong SOC and various diabetes parameters in people with T1D under normal circumstances (i.e., not during a pandemic). The studies found that having a strong SOC was associated with better glycemic control, better conceptions of the disease, better adherence to treatment, and healthier behaviors regarding food choice and exercise [29,36–38].

These studies are in line with our results, as our findings suggest that having a strong SOC is associated with better self-management. Thus, our findings suggest that, during a health crisis such as the COVID-19 pandemic, having a strong experience of comprehensibility and meaningfulness is particularly important for disease management in people with T1D.

5. Strengths and Limitations

The present study would seem to be the first to add significant knowledge about how a pandemic affects longer-term self-management in people with T1D. Regarding external validity or transferability, our findings highlight how self-management in people with T1D evolves over time during an international health crisis, knowledge that can be applied to future contexts. Even though, after the data collection, the COVID-19 pandemic has evolved worldwide due to the vaccinations, it remains clear that the pandemic—including rising infection rates, restrictions, and lockdowns—will continue. Furthermore, it is believed that other pandemics will occur in the future [39,40].

One limitation of the present study is the imbalanced age distribution of our participants. Because we recruited participants from the earlier study, because one of the participants withdrew from the study, and because we had to eliminate one of the interviews, we ended up with only one participant over the age of 30. Given that our sample consisted mostly of young adults, we cannot determine to what extent our findings are representative of people with T1D of all ages. This needs to be studied further. However, our sample represents a relatively diverse group and we saw no significant differences in terms of gender, socioeconomic status, etc., nor was this the purpose of the study.

When the interviews were conducted, the COVID-19 situation in Denmark regarding restrictions, lockdowns, and vaccinations was changing from week to week. To ensure that the situation was the same for all participants, we conducted the interviews over the course of just one week in March 2021, and furthermore, no participants were fully vaccinated and only one was partially vaccinated. Therefore, the situation was nearly the same for all the participants when the interviews were conducted, which is a strength in our study.

Another strength in our study is the use of theory. By applying the theory after conducting the thematic analysis, we added another level of interpretation, which has provided a more thorough knowledge and understanding of our findings.

6. Clinical Implications

Our findings suggest that it is important for people with T1D to have a strong feeling of comprehensibility when they are placed in a risk group, as this feeling enables them to manage their diabetes. Attention needs to be paid to the way in which the issue of risk is conveyed to people with T1D: the information must be provided by their own nurses and doctors in a timely manner, and opportunities must be provided to integrate that information into their own personal understanding of their risk, as it has a major impact on their ability to manage their disease.

Furthermore, our findings suggest that the pandemic contributed to a stronger feeling of meaningfulness (i.e., motivation) in people with T1D with regard to focusing on self-management. In clinical practice, attention needs to be paid to this potential for giving higher priority to their diabetes. People with T1D might need to consider ways to integrate these improvements in self-management into their regular practices when society reopens. Thus, our findings suggest that health professionals need to help people with T1D strengthen their experience of meaningfulness (i.e., motivation) in the future, as this is crucial to having a strong SOC and improving self-management. Better knowledge of SOC in people with T1D and of how SOC affects their ability to manage the disease may help in planning interventions to strengthen SOC and improve self-management.

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