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Received 7 September 2022; Revised 20 March 2023; Accepted 9 June 2023; Published 1 July 2023

Research on peer support programmes for people with type 2 diabetes has shown a positive effect on health-related behaviours, yet little is known about what causes this effect. This study researched the mechanisms generating immediate outcomes (changes in awareness) and intermediate outcomes (behavioural changes) among socially vulnerable people with type 2 diabetes in a Danish peer support intervention. Using a realist-informed evaluation approach, we investigated how nonprofessional volunteers perceived and performed as peer supporters, and how these activated mechanisms in the interaction between peers and peer supporters. Furthermore, we explored how contextual factors related to peers and peer supporters influenced how mechanisms worked. The study was based on a qualitative multimethod case-study design (n = 11). Data consisted of semistructured interviews with four key informants (peer, peer supporter, project manager, and a diabetes nurse) (n = 27), participation observation of two peer supporter training courses, one network meeting, two supervisions for peer supporters, and logbooks from peer supporters. Data were analysed using systematic text condensation. The findings revealed that the peer supporters used their lived experience to perceive and perform in the peer support meetings. Furthermore, being with a like-minded person with type 2 diabetes activated mechanisms, such as trust, respect, empathy, care, and honesty between peers and peer supporters, which led to increased self-care awareness among the peers (immediate outcome). Finally, the findings revealed that contextual factors, such as peer supporters’ lived experiences and peers’ and peer supporters’ sociodemographic characteristics and health conditions, affected how the mechanisms were at stake. Thus, our study contributes on how to support socially vulnerable people with type 2 diabetes and where peer support programmes can supplement the established healthcare system by providing social and emotional support to this vulnerable group. This trial is registered with ClinicalTrials.gov, Retrospective Registration (20 Jan 2021), registration number NCT04722289.
1. Introduction

People with a chronic disease such as type 2 diabetes (T2D) benefit from peer support as it enables them to share knowledge, experience, and emotions with like-minded people [1]. “Peer support” is defined as “support from a person who has experiential knowledge of a specific behaviour or stressor and similar sociodemographic characteristics as the target population” [2]. Thus, a peer supporter offers support on a level that a healthcare professional cannot give. This makes peer support a popular approach, complementing and enhancing the established healthcare system to support people with T2D in managing their disease [3, 4]. Studies have shown improvements in health outcomes from glycaemic control and blood pressure regulation [3, 5] to mental health challenges such as depression and anxiety [3, 6]. Lastly, peer support has been highlighted for its potentially beneficial effects on socially vulnerable people and their management of T2D [7–9]. Socially vulnerable people are characterised by low socioeconomic status, e.g., a low income, education, unemployment, and poor social network [7, 9–11]. Moreover, this group experiences more complications related to T2D, receives less care, and faces multiple barriers to accessing health care services [8, 12, 13].

However, how and why peer support programmes work, especially for socially vulnerable groups, remain unclear, and deeper insights into the underlying mechanisms generating outcomes are needed [14, 15]. As programmes are implemented in complex settings with multiple layers of contextual factors that either facilitate or inhibit how the mechanisms operate, the outcomes often have a mixed pattern [16]. Therefore, it is important not only to rely on a single outcome measure, such as intermediate outcomes, which often are used to measure health-behavioural improvements of peer support programmes but also to measure immediate outcomes (changes in awareness, understanding, and skills), which usually come before behavioural outcomes [17]. Otherwise, valuable outcome patterns may be left unnoticed. This may be particularly important when investigating the effect of peer support programmes among vulnerable groups where health-behavioural improvements may not be achievable [14]. Drawing on the methodological guidance for evaluating complex interventions [18] and the principle of realist evaluation (RE), it is possible to gain a deeper understanding of the underlying mechanisms that make peer support programmes work or fail in different contexts, and how they generate immediate and intermediate outcomes among peers in peer support programmes. This study presents the findings of a realist-informed evaluation of the Danish peer support intervention “Together on Diabetes” (ToD). The study is based on a previous study that found that the ToD intervention only improved diabetes self-management (DSM) and use of health care services (the intended intermediate outcomes) if individual contextual factors among peers, such as their occupation and financial situation, health condition, energy, and other life events, facilitated their engagement in the intervention [14]. However, the study also found that regardless of context, all peers increased their self-care awareness (immediate outcome). Thus, our interest in this study was to explore the mechanisms generating the immediate outcome of increased self-care awareness among peers and not only the intermediate outcomes of health behaviours. We investigated how the peer supporters, as the key provider of the intervention, perceived and performed in the intervention (the resource) and how this impacted the mechanisms (reasonings) activated in the interaction between peer and peer supporters.

1.1. Study Aim. This study aimed to investigate how non-professional volunteers perceived and performed as peer supporters in the Danish “Together on Diabetes” peer support intervention, and how their performances activated mechanisms that generated immediate outcomes of self-care awareness among socially vulnerable peers with type 2 diabetes.

1.2. The "Together on Diabetes" Intervention. The empirical setting for this study was the Danish peer support intervention “Together on Diabetes” developed and implemented in 2017 by the Municipality of Copenhagen’s Centre for Diabetes and the Danish Diabetes Association and evaluated by the University of Copenhagen. The ToD intervention aimed to improve DSM and increase the use of health care services among socially vulnerable people with T2D (peers) through peer support meetings with non-professional volunteers with T2D (peer supporters). The intervention is part of a larger evaluation study of three diabetes interventions developed within the Cities Changing Diabetes Copenhagen partnership programme [19].

The intervention contained five components: (1) recruitment (peers and peer supporters), (2) a two-day mandatory training course for peer supporters, (3) matchmaking peers and peer supporters, (4) six months of individual biweekly peer-to-peer meetings between peers and peer supporters, and (5) bimonthly supervision, and network meetings for peer supporters. The meetings were intended to give the peers social and emotional support, assistance in daily diabetes management, and support in accessing health care services. The training course aimed to introduce and equip the peer supporters to the intervention. Likewise, the supervision and network meetings aimed to assist them with professional support and the opportunity to share and discuss experienced dilemmas and challenges. The matchmaking was carried out by the project manager who matched them based on initial conversations with each of them and on their responses in a matching survey (attached as supplementary material). If both peers and peer supporters agreed to the suggested match, the project manager facilitated a match meeting where they could introduce themselves and discuss expectations and wishes for the peer-to-peer meetings. The inclusion criteria for peer supporters were having well-regulated glycaemic control, basic knowledge of T2D and the Danish healthcare system, and an interest in supporting a socially vulnerable person with T2D.
Inclusion criteria for peers were poorly regulated glycaemic control, multimorbidity, no employment, low/no education, living alone with no/minimal social network and difficulties assessing the healthcare system [14].

2. Theory and Methods

2.1. Research Setting: Peer Support in a Healthcare System Context. The Danish healthcare system is universal and built on the principle of free and equal access for all citizens, as general taxes financed health care services [20]. The healthcare system includes three political and administrative levels: the state, regions, and municipalities. The municipalities are in charge of diabetes rehabilitation outside hospitals, disease prevention, and health promotion [21].

2.2. Theoretical Framework. Following the RE principle [22] and the Intervention-Context-Actor-Mechanism-Outcome (ICAMO) configuration by Mukumbang et al. [23], we developed an empirically tested initial programme theory to uncover the causal relationship between the contexts in which the ToD intervention was implemented, the mechanisms activated within the peers and peer supporters, and the immediate and intermediate outcomes. The ICAMO configuration is an expanded version of the original CMO configuration by Pawson and Tilley [22] as it includes two additional components, “Actor” and “Intervention.” According to Mukumbang et al., it is important to have an explicit focus on the actors involved and how they engage in the intervention, as “programmes can only work when the relevant actors adopt either all or parts of the intervention” [23]. The initial programme theory was based on an overall programme theory for the ToD intervention [14] and findings from our previous study described previously [14]. A graphic illustration of our initial programme theory is shown in Figure 1.

Key terms and frameworks within RE methodology and how they were applied are described in Table 1.

3. Method

We used a qualitative multimethod case study design [26, 27] comprising in-depth interviews with peers, peer supporters, and the project team; participant observations of training courses, supervisions, and network meetings; and project documents, (match survey for peers and peer supporters, and logbook for peer supporters). In total, 12 pairs of peers and peer supporters completed the ToD intervention during the study period (February 2018 to July 2019). Ten peer supporters gave consent to participate in the evaluation whereas one of them had completed peer relationships with three peers, representing three cases. Another case consisted of two peer supporters as one of them had to withdraw from the intervention due to a poor health condition. Overall, it gives a total of 11 cases.

The peers and peer supporters were recruited to the ToD intervention using different strategies. The project manager raised awareness of the intervention through flyers, information meetings, newsletters, and coffee meetings with relevant stakeholders, such as health professionals and civil society organisations who work with socially vulnerable groups with T2D. Based on the latter contacts, snowball sampling was applied, relying on word of mouth among potential participants.

Peer supporters were recruited from the Centre for Diabetes, who had participated in rehabilitation services (N = 5), members from the Danish Diabetes Association (N = 2), the general practitioner (N = 1), or via the ToD interventions web page (N = 2).

Peers were mainly recruited through the Centre for Diabetes (N = 6). They were recruited by health professionals who considered them too vulnerable to participate in the centre’s regular diabetes rehabilitation services. The remaining peers were recruited either through home care (N = 2) or by their general practitioner (N = 1).

3.1. Data Collection. The study consisted of a triangulation of individual semistructured interviews, participant observations, and project documents, all conducted between February 2018 and April 2020.

3.1.1. Observation of Peer Supporter Training, Supervision, and Network Meetings. Observations of training courses (n = 3), supervisions (n = 2), and network meetings (n = 2) for peer supporters were conducted with the observer as the participant [28]. An observational guide was used to observe the supervisions with a professional supervisor and the network meetings’ plenary discussions on challenges and dilemmas experienced in the peer-to-peer meetings. All observations were recorded in field notes.

3.1.2. Individual Interviews. We conducted 27 individual semistructured interviews across the 11 cases. The informants contained peer supporters (n = 10), peers (n = 9), the project manager, and the diabetes nurse. Each type of informant was interviewed per case to gain various perspectives on mechanisms and contextual factors in the peer-to-peer meetings. The project manager and the diabetes nurse, who visited the peers before and after the intervention, were interviewed three times each.

The interviews were conducted immediately after the 6-month intervention. The interview guide was informed by the initial programme theory and field notes from the observations. The guide was semistructured and focused on the peers’ and peer supporters’ reasons for and expectations towards participating in the intervention; how the peer supporters perceived and performed their role; how they experienced the training course, network meetings, and supervisions; reflections on the peers’ improvements; and how contextual factors in the peers’ and peer supporters’ everyday life affected their engagement. Only the informant and the interviewer were present during the interviews. Interviews with peers were conducted in their own homes. Interviews with the remaining informants took place at the Centre for Diabetes. One peer supporter represents three cases. However, in two of the cases, interviews with peers are
missing as they were not interested in participating. Due to restrictions related to the COVID-19 pandemic, seven interviews with peer supporters (n = 3), peers (n = 3), and the project manager (n = 1) were collected by telephone.

3.1.3. Project Documents. Project documents such as match surveys and logbooks were included in the study to provide information on the peer relationship and whether any contextual factors in the peer and peer supporters’ life circumstances influenced the relationship. The match survey consisted of 12 questions and aimed to ensure that the best matches were made between the peers and peer supporters. The surveys gave insights into peers’ and peer supporters’ sociodemographic characteristics, language skills, residence, motivation, peers’ perceived needs, and how they have been recruited. Also, whether they had any requirements for the match (e.g., age, sex, ethnicity, allergies, a nonsmoker, geographic distance, and type of vulnerability). Peer supporters completed the matching survey at the training course, while peers completed the matching survey with assistance from the project manager at an initial meeting. Furthermore, the logbooks contained ten questions and provided insights into peer supporters’ reflections on the peer-to-peer meetings, including activities, their peer-relationship, improvements among their peers, and whether they needed support to tackle any challenges. The logbooks were filled out by the peer supporters after each peer-to-peer meeting.

3.2. Data Analysis. The semistructured interviews were recorded and transcribed verbatim. Field notes of the participant observations were recorded in writing. All transcripts and project documents were managed in NVivo 12 [29]. Systematic text condensation [30] was used to analyse data, consisting of the four following analytical steps: (1) reading transcripts to obtain a general impression of data and identify preliminary themes of relevance to the study aim; (2) identifying and sorting meaning units connected to the preliminary themes; (3) condensation of units and themes; and (4) synthesising data into themes with similar code groups. Informed by the themes and code groups, the initial programme theory was thoroughly discussed by all authors and refined. First author SG conducted the first two analytical steps. The other steps were conducted in collaboration with SG, CG, UC, and SV.

3.3. Ethical Considerations. This study followed the reporting standards for realist evaluations by RAMESES II (Realist and Meta-narrative Evidence Syntheses: Evolving Standards) [31] and the codes of ethics in the Helsinki II Declaration. Ethical approval was obtained from the Danish Data Protection Agency (Rec. No: 2015-55-0630). All participants received verbal and written information about the study and gave their written consent to participate. They were able to withdraw from the study at any time. Confidentiality and anonymity of all participants were maintained throughout the collection of all interviews, analyses, and reporting.

4. Findings

4.1. Characteristics of the Study Sample. As illustrated in Table 2, the ten peer supporters included six males and four females. They were middle-aged, and the majority were of Danish origin. They had different educational backgrounds and employment statuses. Four peer supporters had relevant experience as support persons, working with vulnerable
<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Applied in the study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>“A combination of program elements or strategies designed to produce behaviour changes or improve health status among individuals or a group” [17]</td>
<td>In this study, the intervention was the biweekly peer-to-peer meetings</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>“An irreducible set of factors influencing when and how an intervention is delivered and how mechanisms are triggered” [22]</td>
<td>We investigated how individual contextual factors influenced peer supporters’ perception of and performance in the intervention</td>
</tr>
<tr>
<td>Individual contextual factors</td>
<td>Pawson categorises context into four layers (individual, interpersonal, institutional and infrastructure). The individual layer includes the actors of the programme’s sociodemographic characteristics, capacities, and life circumstances [24]</td>
<td></td>
</tr>
<tr>
<td><strong>Actors</strong></td>
<td>“Individuals, groups, and institutions who play a role in the implementation and outcomes of an intervention” [17]</td>
<td>In this study, the actors were peer supporters and peers</td>
</tr>
<tr>
<td><strong>Mechanism</strong></td>
<td>A mechanism is defined as “a combination of resources offered by the social programme under study and stakeholders”</td>
<td>We investigated how peer supporters perceived and performed in the intervention (resource) and how this resulted in changes (reasonings) in the encounter with peers</td>
</tr>
<tr>
<td>Resources</td>
<td>“Reasoning in response” [22]. Thus, resources and reasoning are mutually constitutive of a mechanism, but to help operationalise the difference between a mechanism and a context Dalkin et al., recommend disaggregating them as separate concepts [25]</td>
<td></td>
</tr>
<tr>
<td>Reasoning</td>
<td>The resource that an intervention provides</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The actors’ reasoning and response to the resources [25]</td>
<td></td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Outcomes of a programme can take many forms, be intended and unintended, as well as they can be multiple and vary across the target group(s) depending on the mechanisms and context [16]</td>
<td>Inspired by Mukumbang et al.[23], we used the terms “immediate outcome” and “intermediate outcome” to disaggregate between changes in awareness and behavioural changes among peers</td>
</tr>
<tr>
<td>Immediate outcomes:</td>
<td>Refers to changes in awareness, skills, or understanding. These types of changes usually come before behavioural changes [17]</td>
<td></td>
</tr>
<tr>
<td>Intermediate outcomes:</td>
<td>Refers to behavioural changes that follow the immediate outcomes [17]</td>
<td></td>
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</tbody>
</table>
groups and/or within health care services. The nine peers included two females and seven males. They were primarily middle-aged men of Danish origin, outside the labour market, with short and intermediate education backgrounds. All peers and peer supporters were diagnosed with T2D and had one or more diabetes complications (cardiovascular diseases, hypertension, neuropathy, and nephropathy). Furthermore, all peers and most of the peer supporters had other diagnoses, such as mental health disorders (depression, stress, and anxiety), arthritis, and KOL.

In the following sections, the study findings are presented. First, the immediate and intermediate outcomes of the intervention are described, as well as how peers’ contexts influenced these. Then, key contextual factors and mechanisms (resources and reasonings) are presented. Finally, the refined programme theory and examples of the causal relationship between the different components are unfolded.

### 4.2. Immediate and Intermediate Outcomes

In the interviews, peers described how sharing experiences, emotions, and concerns helped them to recognise the importance of taking better care of their T2D, such as taking their medication as prescribed, making healthier food choices, and being more physically active. The latter is illustrated in the following quote:

> “I have become more aware that I need to go for walks and exercise a bit.” (Peer, Case 3).

This increased self-care awareness was identified among all nine peers independent of their context. However, in more than half of the cases, contextual factors in peers’ everyday lives, such as an unstable financial situation, a lack of energy, a poor health condition, and/or other harmful events, hindered the increased self-care awareness from leading to behavioural improvements in their DSM. In the following quote, a peer describes how he is aware of his diabetes situation and knows what to eat and how to behave to achieve better treatment goals. However, contextual factors, such as his financial situation on cash benefits combined with poor mental health, prevented him from making the behavioural changes required to improve his DSM [14]:

> “I know so much about the disease. I know so much about what happens to my body and why it happens, and what I should eat as well as how I can control it. However, it is knowledge that is not applied and implemented in my life, and that is my serious problem right now. It is to get it implemented” (Peer, Case 5).

Although improved DSM was only achieved by some peers, the empirical findings showed that many peers achieved other types of intermediate outcomes, such as improved cleaning and tidying up in their homes, better personal hygiene, and getting dressed in the morning. Thus, the outcome patterns in the nine cases show how the intervention initiated processes among peers that could be the first steps towards making behavioural improvements in their DSM but also has value in itself.

### 4.3. Contextual Factors

The empirical findings confirmed that the contextual factors in our initial programme theory (Figure 1) affected how nonprofessional volunteers perceived and performed as peer supporters and, thereby, how the mechanisms generating increased self-care awareness were activated in the peer relationships. For example, peers’ and peer supporters’ sociodemographic characteristics (sex, age, ethnicity, and education level) influenced the extent to which the peer supporters used themselves in the relationships. The number of sociodemographic similarities increased the level of personal engagement. Furthermore, peers’ health conditions (multiple diagnoses and diabetes-related complications) and life circumstances (e.g., occupation and financial situation, level of energy, and other life events) were found to either facilitate or inhibit the meeting frequency and the activities. In addition to the initial programme theory, peer supporters’ lived experience (personal experience living with T2D and working experience) was found to be a contextual factor, as they used their competencies, knowledge, and skills in the encounter with peers. Finally, the health of peer supporters was also discovered to be a contextual factor. In a few cases, sharing the same diagnosis became a barrier as some peer supporters had other diagnoses and/or diabetes-related complications. Consequently, this caused interruptions in the peer relationships as the peer supporters had to cancel some of the biweekly

### Table 2: Sociodemographic characteristics of peer supporters and peers.

<table>
<thead>
<tr>
<th></th>
<th>Peer supporters</th>
<th>Peers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>50–65</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Above 65</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Country of birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Other western countries</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Nonwestern countries</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Source of income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social security</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>State pension</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Disability pension</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Employed</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Secondary</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Higher</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Experience as a support person</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>—</td>
</tr>
</tbody>
</table>

*Experience with peer support; working within healthcare services; and/or with vulnerable groups.*
meetings due to poor physical and/or mental health conditions. In one case, peer supporters’ poor physical health conditions hindered them from participating in the intervention.

5. Mechanisms

5.1. Resources

5.1.1. Use of Lived Experience. Peer supporters used their lived experiences, particularly their personal experiences with T2D, to provide social and emotional support to their peers. However, data showed a pattern in their personal engagement depending on whether they had previous work-related experience as a support person or not. Peer supporters who did not have any previous experiences were more personally engaged. They identified themselves as a befriender with the primary aim to assist their peer with social and emotional support.

“I would say my role has mostly been as a befriender (...) There are other healthcare professionals around the patient. Uh, and that’s not what they.. in my opinion, (...) need. They need social contact.” (Peer supporter, Case 2).

In contrast, those with previous experiences identified themselves as a diabetes support person in accordance with the intervention. According to this group, their role was beyond providing social and emotional support to assist their peers with their daily diabetes management and access to health care services. Furthermore, from their experiences as a support person, they knew that the relationship was temporary. Therefore, they tried to keep a professional distance to their peer:

“I draw on my experiences from work (...), and you make closer contact to some of them than others, but you do always have to keep that professional distance.” (Peer supporter, case 4, 6 and 11).

However, even the most experienced peer supporters found it difficult to distance themselves completely. Contextual factors, such as peers’ sociodemographic characteristics, such as sex, age, ethnicity, and educational level, influenced their personal engagement. This was especially shown in the cases represented by the same peer supporter. Even though the peer supporter had working experience as a support person, she performed her role differently depending on how much she could mirror herself with her peers. In the case where she mirrored herself the most (e.g., same educational level, sex, and ethnicity), she was noticeably more personally engaged:

“I have gotten more of myself into play (...) We have shared knowledge on a completely different level than I have done with the other two. In other words, the equality between us (that equality around the fact) that one person knows something, and the other person knows something else” (Peer supporter, Case 4, 6 and 11).

5.1.2. Adapting the Role. Most peer supporters who identified themselves as a diabetes support person experienced a discrepancy between their expectations of the role presented at the training course and what the role entailed. In almost half of the cases, contextual factors in peers’ life circumstances, such as unstable financial or occupational situations combined with poor health conditions, hindered them from interacting as intended, thereby achieving the intended outcomes. Consequently, this created frustration among many peer supporters as they felt they did not fulfil their role as expected:

“I don’t think I’ve moved him that much (...) Well, I expected something else. (...) I didn’t succeed in changing his diet or anything like that” (Peer supporter, Case 5).

By sharing their frustration at supervisions and network meetings, they understood that this was a common challenge and realised that they still had an important role to play. Thus, they adapted their performance, as well as their expectations of outcomes to their peers’ capabilities, resources, and perceived needs by taking their peers’ circumstances and health condition into account. For example, in the following quote, a peer supporter described how she changed her role perception from being a diabetes support person to a befriender:

“I was about to say stop because I didn’t feel he needed me. I then readjusted mentally; he doesn’t need help with his diabetes. He needs help in his loneliness.” (Peer supporter, Case 5).

5.2. Reasonings. The empirical findings showed how the combination of the different resources created trust, respect, empathy, care, and honesty in the encounter between peers and peer supporters as well as an understanding of each other’s situation.

5.2.1. Experience of Being Equal with a Like-Minded Person Activated Mutual Trust, Respect, Empathy, Care, and Honesty. The fact that the peer supporters were unpaid and nonprofessionals who used their personal experience with T2D to provide social and emotional support activated an experience of being equal:

“You feel more equal than if you are with professionals. There you might be dependent on something from the professionals.” (Peer supporter, Case 1).

Furthermore, it created an authentic relationship based on trust, respect, empathy, care, and honesty, making the peers feel safe and engaged in the intervention:

“He was very dismissive of me (...) But when he realised that I came because I wanted to offer him my help as a volunteer-he then wanted to talk to me (...) “The fact that I was a volunteer was crucial for him because he opened up to me (...) He then knew that nothing would be reported to the Municipality about him. He was very afraid of that.” (Peer supporter, Case 4).

Across all cases, these mechanisms permeated the relationships, which enabled them to talk about personal issues
and challenges they would not share with family members or friends. Moreover, many peers described how their peer relationship differed from consultations with healthcare professionals as they, to a larger extent, felt met with care and empathy, and without any judgement, assessment, or held accountability for anything they said:

“After all, we relate to each other as people, and not clients, and that gives a human face, which I like.” (Peer, Case 11).

The ability of the peer supporters to adapt their role and expectation of the programme to fit the complex lives of the peers as described under resources had critical importance for the activation of mechanisms. The adaptation created trust, care, and empathy in the sense that the peers felt heard, understood, recognised, and not judged. This transformation of the peer supporters’ role was conducted without the programme losing meaning to the peer supporters. Finally, the experience of being equal created mutual respect. They showed each other respect by attending the biweekly meetings, complying with their agreements, being honest, and did not waste each other’s time:

“We had that mutual respect, right? (...) At first, he thought I was getting paid for it (being a peer support, red.) When he found out I didn’t get paid for visiting him, he realised that we shouldn’t waste each other’s time.” (Peer supporter 2, Case 7).

5.2.2. Sharing the Same Diagnosis Evoked an Understanding of Each Other’s Situation. Sharing the same diagnosis facilitated the relationship as they mirrored themselves in each other because they had gone through similar life-changing events. This created an understanding of each other’s life situations, to which many peers were a relief. They did not need to explain themselves nor talk about the illness to make their peer supporter understand their situation:

“It means so much that the person who steps in has an insight into your flaws. So, it’s such a huge relief that you don’t have to talk about it (T2D, ed.) at all, but just act in the areas where it’s necessary, right?” (Peer, Case 1).

Likewise, many peer supporters addressed how sharing the same diagnoses, including what it entails of behavioural changes (e.g., taking diabetes medication daily), created a mutual understanding of everyday life with T2D:

“It came as a shock to him that he suddenly had to take medicine. It did that for me too. And then we talked a little about it (...) It meant that we also here were in the same situation.” (Peer supporter 2, Case 7).

5.3. Refined Programme Theory. Based on our empirical findings, we developed a refined programme theory (Figure 2).

As illustrated in the refined programme theory, contextual factors influenced how peer supporters identified themselves and how they adapted their performance in the intervention. However, although they identified themselves and performed differently, the fact that the peer supporters were nonprofessionals, unpaid, and shared the same diagnoses created an experience of “being equal,” which activated mechanisms, such as trust, respect, empathy, care, and honesty between peers and peer supporters. This is also shown in the ICAMO configuration as follows (Figure 3), which also demonstrates the influence of peer supporters’ work-related experiences and the number of sociodemographic similarities between the peer and the peer supporter. The ICAMO matrix in Table 3 shows how each component is linked.

6. Discussion of the Findings

6.1. Main Findings. In this multimethod case study, we explored how being with a like-minded person with T2D increased self-care awareness (immediate outcomes) and subsequently, depending on the context, generated behavioural changes (intermediate outcomes) among socially vulnerable people with T2D. Furthermore, we explored how the peer supporters drew upon their lived experience (personally and work-related) to identify themselves in the role and set up personal boundaries for their engagement as well as to provide social and emotional support. Similarly, the findings revealed how peer supporters were able to adapt their performance as well as their expectations of outcomes by taking into account their peers’ circumstances and health conditions. Four individual contextual factors were found to impact the peer supporter’s perception of and performance in the intervention: peer supporters’ lived experience, peers’ life circumstances, and peers’ and peer supporters’ sociodemographic characteristics and health conditions. By focusing on the peer supporter, as the key provider of the intervention, we achieved a deeper understanding of how and why the ToD intervention activated mechanisms, such as trust, respect, empathy, care, and honesty, which then led to increased self-care awareness and among some cases improved DSM and use of health care services. Thus, when evaluating complex health interventions, we emphasise the importance of measuring both immediate and intermediate outcomes [32]. This is because behavioural changes are usually preceded by changes in awareness, skills, or understanding. The growing body of literature on peer support tends to focus on measuring the intervention effect (effect evaluation) [6] or fidelity issues in process evaluations [33]. Therefore, we contribute with novel knowledge to this field as behavioural changes may not be achievable, especially not for socially vulnerable groups [9]. However, peer support interventions targeting socially vulnerable people do have promising potential. We believe that the analysis of mechanisms is at a level of abstraction that goes beyond the ToD intervention, as some study findings have been reported elsewhere. For example, the experience of being equal is reported in other
studies on peer support for people with T2D [34, 35] and on peer support within mental health services [15, 36]. However, comparing our findings to the existing literature on T2D peer support often is difficult as many peer support interventions include other approaches (e.g., group- or telephone-based) targeted at other groups. Furthermore, they are carried out by other stakeholders, such as churches and community organisations [37, 38]. Finally, they are
Table 3: Matrix of the intervention-context-actor-mechanism-outcome configurations based on the findings (adapted by Mukumbang et al. [23]).

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Context</th>
<th>Actor</th>
<th>Mechanism</th>
<th>Immediate</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biweekly peer-to-peer meetings</td>
<td>Individual contextual factors</td>
<td>Peer supporters</td>
<td>Peer supporters obtain knowledge about the supporter role and adapt their role performance to respond to peers’ situations, perceived needs, and resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ life circumstances (occupation and financial situation, energy, other life events)</td>
<td>Peer supporters</td>
<td></td>
<td>Increased self-care awareness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ health condition (multiple diagnoses, diabetes-related complications)</td>
<td>Peers</td>
<td>Peer supporters use their work-related experience to identify with the role and establish personal boundaries in their peer relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peer supporters’ work-related experience</td>
<td>Peer supporters</td>
<td>Experience of being equal with a like-minded person (unpaid and nonprofessional) activated mutual trust, respect, empathy, care, and honesty</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peer supporters’ personal experience with T2D</td>
<td>Peer supporters</td>
<td>Peer supporters use their personal experience with T2D to provide social and emotional support</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ and peer supporters’ health conditions (multiple diagnoses, diabetes-related complications)</td>
<td>Peers</td>
<td>Sharing the same diagnosis evoked an understanding of each other’s life situations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers’ and peer supporters’ sociodemographic characteristics (sex, age, ethnicity, and education level)</td>
<td>Peer supporters</td>
<td>When peers and peer supporters shared similar sociodemographic characteristics, the level of personal engagement among peer supporters increases</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Intended: Improved diabetes self-management and use of healthcare services* (*if contextual factors in peers’ everyday lives facilitated their engagement in the intervention*)

*Unintended: Improved cleaning and tidying up in their homes*

Better personal hygiene and getting dressed in the morning
implemented in other countries, hence contexts, and thus other welfare systems that differ markedly from the Danish.

6.2. Strengths and Limitations of the Study. This study has several strengths. First, including socially vulnerable people as the target population is a strength. This group is often hard to reach and engage and is thus understudied [39]. Using the ICAMO configuration [23], we discovered that peer supporters identified and engaged themselves differently in different contexts. These findings would not be possible to discover by only evaluating changes in outcomes. Moreover, the use of case studies, recommended when analysing complex interventions [31, 40], allowed us to test the initial programme theory and verify whether propositions could be reproduced in different cases. Also, the triangulation of methods and data sources enhancing the credibility of the findings gave us a broader and more nuanced understanding. Lastly, our relatively large sample size of eleven cases with four different informants \((n = 27)\) ensured sufficient information power [41] to conduct the study. Our study does also have some limitations. Due to restrictions related to the COVID-19 pandemic, seven interviews (three with peers) were performed via telephone, limiting the interviewer’s access to verbal nuances and nonverbal communication. Nevertheless, comparing these with the other interviews, we do not find that this had consequences for our analysis. Also, our analysis focused on individual contextual factors. Another context focus (e.g., the institutional level) [42] could have provided us with other analytical findings.

6.3. Implications for Practice and Future Research. Our study helps to fill the gap in the research literature on mechanisms underpinning peer support targeting vulnerable groups with T2D [15]. The findings showed how most of the mechanisms were reciprocally activated in the encounter between peers and peer supporters. Thus, we find it relevant that future research focuses on investigating the mechanisms activated within all key actors and not only the target group. Moreover, instead of having a traditional focus on behavioural improvements, we also recommend measuring changes in awareness, understanding, and skills as such changes may be left unnoticed. Likewise, we suggest policymakers be aware that behavioural improvements may not be achievable for all target populations, especially socially vulnerable groups when designing interventions. Finally, we recommend peer support as a supplement to the established healthcare system to provide social and emotional support to socially vulnerable people with T2D.

7. Conclusion

In this study, we explored the underlying mechanisms activated between peers and peer supporters in a Danish peer support intervention targeting socially vulnerable people with T2D. By focusing on how peer supporters, as the intervention’s key providers identified themselves with the role and performed in the intervention, we gained a better understanding of why and how the intervention activated mechanisms (e.g., trust, respect, care, honesty, and empathy) between peers and peer supporters. Three contextual factors influenced how the peer supporters perceived and performed their role, and thereby, how the mechanisms were at stake. Using principles from realist evaluation and by disaggregating mechanisms into “resources” and “reasonings,” our study provides insight into which peer support programmes work, for whom and under what circumstances. Furthermore, the study contributes with novel, in-depth findings about how to reach socially vulnerable groups in complex health interventions; groups that healthcare systems, even in a universal welfare system as the Danish, cannot reach.

Abbreviations

- DSM: Diabetes self-management
- ICAMO: Intervention-context-actor-mechanism-outcome
- T2D: Type 2 diabetes
- RE: Realist evaluation

Data Availability

The data and transcripts used during the study are available from the corresponding author upon reasonable request.

Additional Points

What is known about this topic and what this paper adds? What is known? (1) Peer support targeting people with chronic diseases, such as type 2 diabetes, has shown positive effects on health. (2) Peer support is increasingly implemented to supplement the established healthcare system to support people with type 2 diabetes in managing their disease. (3) Limited research has investigated the underlying mechanisms causing a positive effect. What the paper adds. (1) The usefulness of a realist-informed evaluation to explore a peer support programme for socially vulnerable people with type 2 diabetes. (2) Insights into key mechanisms and contextual factors enlightening how and why the programme has potential. (3) Insights on the importance of measuring both immediate and intermediate outcomes in evaluations, as intermediate outcomes, such as healthcare improvements may not be achievable for socially vulnerable groups.

Ethical Approval

This study followed the codes of ethics of the Declaration of Helsinki and was approved by the Danish Data Protection Agency. Rec. No: 2015-55-0630.

Consent

The participants received verbal and written information about the study and gave written consent to participate. They were informed that they could withdraw from the study and guaranteed anonymity.
Conflicts of Interest
The authors declare that they have no conflicts of interest.

Authors’ Contributions
S.G., U.C., and C.G. conceptualized the study; S.G., U.C., and C.G. developed methodology; S.G., U.C., S.V., M.P., and C.G. validated the study; S.G., U.C., and S.V. did formal analysis; S.G. and M.P. investigated the study; S.G., M.P., U.C., and S.V. curated the data; S.G. wrote the original draft; U.C., S.V., M.P., and C.G. reviewed and edited the manuscript. All authors have read and agreed to the published version of the manuscript.

Acknowledgments
The authors would like to thank peers, peer supporters, the project manager, and the diabetes nurse who participated in the study. Moreover, the authors thank the project manager for recruiting peer supporters and peers. Finally, the authors would like to thank Louise Hesseldal for her valuable comments on a previous version of this paper. This study was funded by the Innovations Fund Denmark (50%) (Application number: 7091-00008B), Cities Changing Diabetes: a meta-analysis of randomized clinical trials, vol. 43, Article ID 20210900, 2021.

Supplementary Materials
Match survey for peers. Match survey for peer supporters. Logbook for peer supporters. (Supplementary Materials)

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[23] F. C. Mukumbang, B. Marchal, S. Van Belle, and B. van Wyk, “Unearthing how, why, for whom and under what health system conditions the antiretroviral treatment adherence club intervention in South Africa works: a realist theory refining


