Received: 24 March 2021 | Revised: 2 July 2021 | Accepted: 2 July 2021

DOI: 10.1002/eat.23578

ORIGINAL ARTICLE

International Journal of EATING DISORDERS WILEY

Feasibility of a virtually delivered eating disorder prevention program for young females with type 1 diabetes

Line Wisting PhD[1,2] | Severina Haugvik RD, MPhil[3,4] | Anne Louise Wennersberg SW[1] | Trine Wiig Hage PhD[1] | Eric Stice PhD[5] | Marion P. Olmsted PhD[6] | Ata Ghaderi PhD[7] | Cathrine Brunborg MS[8] | Torild Skrivarhaug MD, PhD[2,3,4,9] | Knut Dahl-Jørgensen MD, PhD[2,3,4,9] | Øyvind Rø MD, PhD[1,10]

[1]Regional Department for Eating Disorders, Division of Mental Health and Addiction, Oslo University Hospital, Oslo, Norway

[2]Oslo Diabetes Research Centre, Oslo, Norway

[3]Division of Childhood and Adolescent Medicine, Oslo University Hospital, Oslo, Norway

[4]The Norwegian Diabetes Centre, Oslo, Norway

[5]Department of Psychiatry and Behavioral Science, Stanford University, Stanford, California, USA

[6]Department of Psychiatry, University of Toronto, Toronto, Canada

[7]Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

[8]Oslo Centre of Biostatistics and Epidemiology, Research Support Services, Oslo University Hospital, Oslo, Norway

[9]Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway

[10]Institute of Clinical Medicine, Mental Health and Addiction, University of Oslo, Oslo, Norway

Correspondence
Line Wisting, PhD, Regional Department for Eating Disorders, Division of Mental Health and Addiction, Oslo University Hospital, P.O. Box 4956 Nydalen, 0424 Oslo, Norway.
Email: line.wisting@ous-hf.no

Funding information
Loretta Anne Rogers Chair in Eating Disorders at the University of Toronto and University Health Network; Dam Foundation via the Norwegian Diabetes Association

Action Editor: Tracey Wade

Abstract

Objective: This study aimed to develop a virtual diabetes-specific version of the eating disorder (ED) prevention program the Body Project, and to assess feasibility and preliminary efficacy of this program for young females with type 1 diabetes.

Method: Young females with type 1 diabetes aged 16–35 years were invited to participate in the study. A total of 35 participants were allocated to five Diabetes Body Project groups (six meetings over 6 weeks) and completed pretest assessments; 26 participants completed all sessions and posttest assessments (<7 days after last meeting). Primary measures included ED risk factors and symptoms, and secondary outcomes included diabetes-specific constructs previously found to be associated with ED psychopathology (e.g., diabetes distress and illness perceptions).

Results: The ease of recruitment, timely conduct of five groups, moderate drop-out rate and appreciation of the intervention by participants indicated that the Diabetes Body Project is feasible. Meaningful reductions occurred on the primary outcomes (i.e., ED psychopathology, body dissatisfaction, and thin ideal internalization) and on internalization of appearance ideals and appearance pressures at posttest (Cohen's *d*

ranging from .63 to .83, which are medium to large effects). Small to medium effect sizes were found for diabetes illness perceptions and distress (.41 and .48, respectively).
Discussion: The virtual Diabetes Body Project is a promising and much-needed intervention, worthy of more rigorous evaluation. A randomized controlled trial is warranted to determine its effectiveness compared with a control condition.

KEYWORDS
body dissatisfaction, body image, diabetes mellitus, type 1, feeding and eating disorders, health psychology, population at risk, preventive programs

1 | INTRODUCTION

Young females with type 1 diabetes are at risk for developing eating disorders (ED), with a twofold to threefold higher prevalence compared with their peers without diabetes (Young et al., 2012). A significant number of young women have disordered eating behaviors (DEB) but do not meet full diagnostic criteria for ED (Olmsted, Colton, Daneman, Rydall, & Rodin, 2008). In addition to female gender and young age, risk factors for the development of ED include pursuit of the thin beauty ideal, body dissatisfaction, and negative affect, as proposed by the dual pathway model (Stice, Marti, Shaw, & Rohde, 2019). Moreover, potential diabetes-specific risk factors include weight loss at disease onset, followed by weight gain with insulin treatment, dietary control as part of diabetes management, and the availability of intentional insulin omission to control weight (Rodin & Daneman, 1992). Insulin omission is associated with impaired glycemic control and a threefold increase in mortality (Goebel-Fabbri et al., 2008). Also, diabetes-specific illness perceptions (Wisting, Rø, Skrivarhaug, Dahl-Jørgensen, & Rø, 2019; Wisting, Siegwarth, Skrivarhaug, Dahl-Jørgensen, & Rø, 2020) and diabetes distress (Saßmann et al., 2020; Strandberg, Graue, Wentzel-Larsen, Peyrot, & Rokne, 2014) have been associated with ED psychopathology and poor glycemic control among individuals with type 1 diabetes, especially young females. Females who have diabetes and are in their late adolescence or early adulthood appear to be at particular risk for developing ED (Wisting, Skrivarhaug, Dahl-Jørgensen, & Rø, 2018). A longitudinal study (Colton et al., 2015) found that DEB was common and persistent among young females with type 1 diabetes; at 14-year follow-up, 32% met criteria for a current ED, and the lifetime prevalence of EDs was 60%. Comorbid type 1 diabetes and DEB/ED are associated with poor glycemic control and increased rates of morbidity and mortality (Nielsen, Emborg, & Mølbak, 2002).

Despite the frequency and severity of this comorbidity, only a few studies have investigated effective prevention approaches. Olmsted et al. (Olmsted, Daneman, Rydall, Lawson, & Rodin, 2002) evaluated the effect of a six-session psychoeducation program for young females with type 1 diabetes and disordered eating behaviors or attitudes, and reported significant reductions in eating restraint, eating concern, drive for thinness, and body dissatisfaction, with small to medium effect sizes. However, there were no improvements in frequency of insulin omission or glycemic control. Meta-analyses of ED prevention interventions in the general population have found that interactive approaches are more effective than passive psychoeducation approaches in reducing ED risk factors (Stice, Shaw, & Marti, 2007). The Body Project, an interactive program designed specifically for individuals at risk for ED, has the strongest evidence of effectiveness in reducing ED risk factors and symptoms (Le, Barendregt, Hay, & Mihalopoulos, 2017), and preventing future ED onset among young females (Stice et al., 2019). The evidence base for the Body Project for individuals without type 1 diabetes is strong, with over 20 randomized trials finding that it reduces ED risk factors, symptoms, and future ED onset compared with control conditions and alternative interventions (Bailey et al., 2014; Stice et al., 2019; Stice, Rohde, Shaw, & Gau, 2020).

The Body Project was originally designed as a face-to-face intervention, which limited availability to those who were able to attend in-person. In order to reduce barriers to access, Stice et al. (Stice, Rohde, Durant, & Shaw, 2012; Stice, Rohde, Shaw, & Gau, 2017) developed an internet-delivered Body Project (eBody Project), in which participants complete six modules over the course of 3 weeks. However the effects of the eBody Project were weaker than produced by in-person groups, possibly due to lack of group interaction and group accountability. To overcome these challenges, Ghaderi, Stice, Andersson, Enö Persson, and Allzén (2020) examined the effectiveness of virtually delivered Body Project groups in females in the general population aged 15–20 years. At 2-year follow-up, Body Project participants compared with placebo control participants showed a 77% lower incidence of ED onset and significantly greater reductions in ED symptoms and risk factors, including body dissatisfaction and thin ideal internalization. This suggests that virtual delivery of Body Project groups may be an effective and more accessible prevention strategy for individuals at risk of ED.

Given the robust evidence of the effectiveness of the Body Project for individuals without type 1 diabetes, a version of this prevention program adapted for individuals with type 1 diabetes may be a viable option for prevention of ED in this population. This study therefore aimed to develop a virtual diabetes-specific version of the Body Project (i.e., Diabetes Body Project), and to assess feasibility and preliminary effectiveness of this program for young females with type 1 diabetes at risk of developing ED. We hypothesized that the Diabetes Body Project would improve (a) ED risk factors such as body dissatisfaction, thin beauty ideal internalization, and negative affect and ED symptoms; (b) appearance ideals and pressures, social comparison, and clinical impairment due to ED attitudes and behaviors; and (c) diabetes-specific psychological functioning such as diabetes distress and illness perceptions.

2 | METHODS

2.1 | Design

We used the Medical Research Council framework for the development and evaluation process (Craig et al., 2013). The current study completed the *development*, *feasibility*, and *piloting* phases and may inform a future RCT.

2.2 | Participants and procedures

Young females with type 1 diabetes were invited to participate in the study. A Norwegian website (www.bodyproject.no) was designed to facilitate recruitment and project profiles were posted on Facebook and Instagram. The link to the website was shared via the Norwegian Diabetes Association online platforms. Additionally, the Norwegian Childhood Diabetes Registry shared the link with their pediatric outpatient clinics to

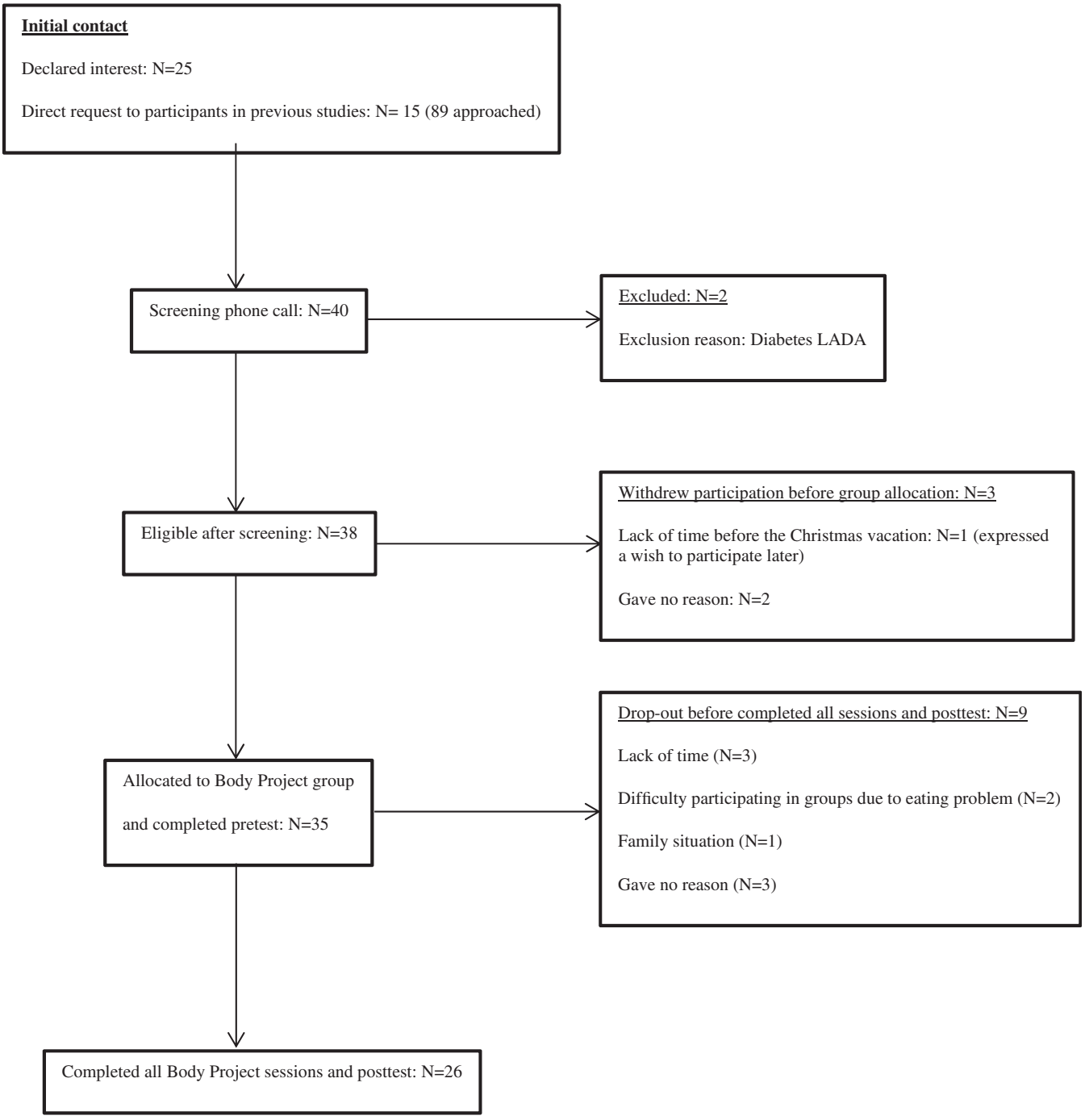

FIGURE 1 Flow chart to describe the recruitment process

publicize the study. Individuals expressed interest by sending an e-mail to the Body Project mailbox hosted by Oslo University Hospital, which lead to a screening call to determine eligibility. Inclusion criteria were: female, aged 16–35 years, type 1 diabetes and self-reported body image concerns. Exclusion criteria were: latent autoimmune diabetes in adults (LADA). In addition to an open recruitment approach, 89 eligible participants from our earlier cross-sectional prevalence studies on type 1 diabetes were invited directly via a cell phone text message. A total of 40 individuals declared interest (including 15 participants from previous studies), 38 were screened and determined eligible and 35 were allocated to five different groups between September and December 2020. Allocation to groups was based on the order in which participants declared interest and availability at meeting times (specific days and times). Participants completed online assessment questionnaires prior (≤7 days) to the first group meeting (pretest) and no longer than 7 days after the last group meeting (posttest), resulting in an interval of 6–8 weeks between assessments. The recruitment process is shown in Figure 1. Ethical approval for the study was gained from the regional ethical committee (REC) north (reference 6,860). All participants signed informed consent documents.

This project was supported by Dam Foundation, conducted in collaboration with the Norwegian Diabetes Association and led by the Regional Department for Eating Disorders, division of Mental Health and Addiction, Oslo University Hospital. Six group facilitators led the Body Project groups, all employed by Oslo University Hospital. Facilitators included three registered nurses, one researcher with a PhD in health psychology, one social worker, and one clinical dietitian. Work experience relating to ED and/or type 1 diabetes ranged from 11 to 19 years. Group facilitators attended a Body Project training workshop by founder and co-author ES, and rehearsed internally to prepare for intervention delivery.

2.3 | The intervention

The Body Project is a group-based ED prevention program based on the principles of cognitive dissonance theory. According to Festinger (1957), cognitive dissonance occurs when there is an inconsistency between one's beliefs and one's actions. This inconsistency creates psychological discomfort, which motivates the individual to reduce cognitive discord by changing their beliefs to align with their actions. In the Body Project, participants collectively critique the thin beauty ideal through a series of verbal, written, and behavioral exercises. Engaging in these activities prompts participants to align their attitudes with their publicly displayed behaviors, which results in a reduction in pursuit of the thin beauty ideal, which in turn is theorized to reduce body dissatisfaction and ED symptoms. Consistent with this theory, reductions in pursuit of the thin beauty ideal mediated the effects of the Body Project on ED symptom reduction (Stice, Presnell, Gau, & Shaw, 2007). The Body Project reduced brain reward region response to thin models (Stice, Yokum, & Waters, 2015), positive implicit attitudes toward the thin beauty ideal (Kant, Wong-Chung, Evans, Stanton, & Boothroyd, 2019), and attentional bias for the thin beauty ideal (Tobin, 2020).

We translated the latest version of the Body Project manual (Stice et al., 2020) to Norwegian. The Body Project has previously been translated to other languages, including Swedish, Icelandic, Spanish, Portuguese, French, German, Greek, Chinese, and Japanese. We adapted the Body Project to include issues specifically related to type 1 diabetes by adding two sessions after the original four. Two individuals with type 1 diabetes were user representatives and contributed to the development of the diabetes-specific content. Thus, the Diabetes Body Project involved six weekly delivered 1-hr sessions. Groups consisted of 6–8 participants and two facilitators. Diabetes-specific content was based on the previous psychoeducation study by Olmsted et al. (2002), though delivered in a dissonance-based interactive format with open questions from group leaders encouraging participants to generate their own answers. Additionally, we added content on social comparison, based on a previous study by Green et al. (2017b). The specific content of each session, in which all activities are designed to induce dissonance about the pursuit of the thin beauty ideal, is described in Table 1. Finally, inspired by Ghaderi et al. (2020), we adopted a virtual-delivery format. Practical adaptations included online distribution of pre/posttests, home exercises, and notes from discussions on shared screen (e.g., definition of the thin beauty ideal and advantages of insulin use). Participants confirmed they were alone at the beginning of each session.

2.4 | Measures

2.4.1 | Primary outcomes

Internalization of the thin beauty ideal was assessed with the Ideal-Body Stereotype Scale-Revised (IBSS-R; Stice, Marti, Shaw, & O'Neil, 2008), which consists of eight items and assesses internalization of the thin beauty ideal. It has high internal consistency ($\alpha = .91$) and 2-week test–retest reliability ($r = .80$; Stice et al., 2017); $\alpha = .84$ in the current study. Body dissatisfaction over the last month was measured by nine items from the Body Parts Scale (Bersceid, 1973). It has high internal consistency (mean Cronbach's α of .94) and test–retest reliability ($r = .90$; Stice et al., 2020); $\alpha = .87$ in the current study. Eating restraint was assessed with the 10-item Dutch Restrained Eating Scale (DRES; Van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986). It has good test–retest reliability ($r = .82$) and internal consistency (mean Cronbach's α of .94; Stice et al., 2020); $\alpha = .83$ in the current study. Negative affect was measured by the 20 negative affect items from the Positive and Negative Affect Schedule-Revised (PANAS-X; Watson & Clark, 1992), which indicates how participants have felt during the past week. It has high internal consistency (mean Cronbach's α of .94), test–retest reliability ($r = .78$), and convergent validity (Stice et al., 2020); α was .93 in the present study. ED psychopathology was assessed by the 16-item Diabetes Eating Problem Survey-Revised (DEPS-R; Markowitz et al., 2010), a diabetes-specific screening tool for disordered eating which assesses insulin omission, meal skipping, self-induced vomiting, and body/weight concerns over the past month. Scores of 20 or higher on the DEPS-R indicate a level of DEB that warrants further attention.

TABLE 1 Content of the Diabetes Body Project

Session	Content	Home exercise
1	• Welcome and presentation of group facilitators and participants • Collectively define the appearance ideal • Discuss costs of pursuing this ideal	• Write a letter to a younger girl about costs of pursuing the appearance ideal • Stand in front of a mirror and record positive physical, emotional, intellectual, and social self-qualities
2	• Present and discuss letter to a young girl and the mirror home exercise • Attempt to dissuade group facilitators from pursuing the appearance ideal in role-plays	• Write a letter to someone who has made a negative comment about their appearance and how they would respond now • Generate a top-10 list of things people can do to challenge the appearance ideal
3	• Present and discuss the letter to a thin-idealist and the top-10 list home exercises • Conduct a role-play in which they challenge appearance-ideal statements • Discuss personal body image concerns	• Engage in two activities that challenge the appearance ideal • Write a letter to their younger self about how to avoid body image concerns
4	• Present and discuss the body activism and the letter about how to avoid body image concerns home exercises • Engage in discussions about the negative effects of social comparison • Discuss advantages and costs of social media	• Tracking sheet to register situations in which they compare their appearance to others and state alternative ways of thinking • Challenge appearance focus on social media
5	• Present and discuss the social comparison tracking sheet and challenge appearance focus in social media home exercises • Discuss strategies to live well with diabetes and maintain good self-care • Physiological and psychological advantages of insulin are discussed	• Writing a letter to a younger girl with type 1 diabetes with advice on how to gain a more positive relationship with her diabetes • A creative tribute to insulin
6	• Present and discuss the letter to a younger girl with type 1 diabetes and the create a tribute to insulin home exercises • Promote discussions of benefits of the groups and what participants learned, and how they can continue some of the exercises introduced in the diabetes body project groups	• Participants are encouraged to engage in at least one more self-affirmation exercise and e-mail the group facilitators to tell them how it went

The DEPS-R has demonstrated good psychometric properties, with a Cronbach's α of .86 and convergent validity with HbA1c, BMI, and blood glucose monitoring (Markowitz et al., 2010). The DEPS-R has been validated in Norwegian adolescents (Wisting, Frøisland, Skrivarhaug, Dahl-Jørgensen, & Rø, 2013) and adults (Wisting, Wonderlich, Skrivarhaug, Dahl-Jørgensen, & Rø, 2019).

2.4.2 | Secondary outcome measures

Appearance ideal internalization/perceived pressure was assessed with the Social Attitudes Toward Appearance Questionnaire 4-Revised (SATAQ-4R) for females (Schaefer, Harriger, Heinberg, Soderberg, & Kevin Thompson, 2017). The SATAQ-4R consists of 31 items with subscales which measure: internalization thin/low body fat, internalization of muscularity, internalization of general attractiveness, pressures from family, pressures from peers, pressures from significant others, and pressures from media. Internal consistency (Cronbach's $\alpha \geq .82$) and construct validity have been demonstrated. The total score was used in the current study, and Cronbach's α was .83. The Social Comparison Scale (SCS; Allan & Gilbert, 1995) measures social comparison and relative rank. It consists of 11 constructs (e.g., incompetent versus competent), on which participants compare themselves to other people. Good internal consistency (Cronbach's $\alpha = .88$) has been demonstrated; $\alpha = .80$ in the current study. The 16-item Clinical Impairment Assessment (CIA; Bohn et al., 2008) was included to measure clinical impairment related to ED. It has high internal consistency (Cronbach's $\alpha = .97$), test–retest reliability at .86,

and construct validity demonstrated by positive correlations with ED behaviors and attitudes ($r = .89$). The CIA has been translated and validated in Norwegian (Reas, Ro, Kapstad, & Lask, 2009). Cronbach's α was .90 in the current study. Finally, two diabetes-specific measures previously found to be associated with ED psychopathology were included as secondary outcomes. The 20-item Problem Areas In Diabetes (PAID) assesses diabetes distress (Polonsky et al., 1995) by assessing emotional states frequently reported when living with diabetes. PAID has been translated and validated in Norwegian, and good psychometric properties have been demonstrated (Graue et al., 2012). Cronbach's α was .91 in the present study. The Brief Illness Perception Questionnaire (BIPQ; Broadbent, Petrie, Main, & Weinman, 2006) is a measure of illness perceptions and consists of eight items addressing: consequences, timeline, personal control, treatment control, identity, coherence, emotional representation, and concern. Test–retest reliability, concurrent validity, discriminant validity, and predictive validity have previously been reported (Broadbent et al., 2006), and Cronbach's α in the present study was .76. Clinical data include self-reported glycated hemoglobin (HbA1c), treatment mode (insulin pen vs. pump), and age of diabetes onset. HbA1c is a clinical measure indicating a person's glycemic control the past 8–12 weeks and is referred to in percent and mmol/mol. The higher the HbA1c, the greater the risk of developing diabetes-related complications. Diagnostic criteria for diabetes is HbA1c ≥ 6.5%/48 mmol/mol. Target for treatment is HbA1c < 7%/53 mmol/mol. BMI was calculated based on self-reported weight and height (kg/m^2).

2.5 | Statistical analyses

Descriptive statistics are presented as means with *SD* or proportions. Paired sample *t*-tests were employed to assess within-group changes from pretest to posttest. Effect sizes were calculated by means of Cohen's *d*. Following the guidelines by Cohen (1988), effect sizes >0.2 were interpreted as small, >0.5 as medium, and >0.8 as large. Multiple imputations (MI) under the assumption of missing at random (MAR) were used to replace the missing endpoints at posttest according to intention-to-treat principle. All available data were used (e.g., predictors, outcome variables, and subscales) to generate 30 imputed data sets. Quantile–quantile (Q–Q) plots confirmed that no measures required a normalizing transformation. Statistical analyses were conducted using IBM SPSS version 26 for Windows.

3 | RESULTS

3.1 | Participant characteristics

Demographic and clinical features are presented in Table 2. Thirty-five females with type 1 diabetes were allocated to one of five Body Project groups and completed pretests: 26 completed all six meetings and posttests. The nine participants who dropped out during the course of the group sessions did not differ significantly from participants completing all sessions in terms of baseline demographic and clinical characteristics. Mean DEPS-R total score was 18.4 (*SD* 9.03). At baseline, 42.9% of the participants scored above the DEPS-R cut-off (≥20), versus 26.9% at posttest (Figure 2). Mean (*SD*) HbA1c at baseline was 7.44% (1.10)/57 mmol/mol. Use of an insulin pump was most common (74.3%) and 25.7% used multiple injections with an insulin pen.

3.2 | Feasibility

The recruitment and retention process is depicted in Figure 1. Of the 35 participants allocated to a group and completing pretest,

TABLE 2 Participant characteristics: Mean and standard deviation of demographic and outcome variables at baseline

	All $N = 35$	Completers $N = 26$	Noncompleters $N = 9$	*t*	Sig.
Age (years)	25.34 (3.71)	25.62 (3.95)	24.56 (2.96)	−.73	.468
BMI (kg/m^2)	25.59 (4.90)	26.17 (5.25)	23.80 (3.23)	−1.20	.241
Age diabetes onset (years)	9.34 (6.03)	9.50 (6.81)	8.89 (3.10)	−.26	.798
HbA1c %/mmol/mol	7.44 (1.03)/58 ($N = 25$)	7.28 (1.00)/56	7.84 (1.07)/62	1.25	.224
DEPS-R total score	18.94 (9.03)	18.50 (8.90)	20.22 (9.82)	.49	.629
Internalization of the thin beauty ideal (IBSS-R)	3.34 (.65)	3.39 (.68)	3.21 (.57)	−.71	.480
Eating restraint	2.57 (.62)	2.53 (.67)	2.71 (.44)	.77	.447
Body dissatisfaction	3.39 (.65)	3.44 (.56)	3.25 (.89)	−.78	.443
Appearance ideal internalization/perceived pressure (SATAQ-4R)	89.23 (14.44)	89.77 (15.01)	87.67 (13.39)	−.37	.713
Social comparison	57.71 (11.78)	56.35 (12.15)	61.67 (10.21)	1.18	.249
PAID total score	40.89 (16.97)	40.91 (19.25)	40.83 (8.13)	−.02	.990
BIPQ overall score	37.49 (8.95)	37.85 (9.98)	36.44 (5.27)	−.40	.692

Note: Data are mean (*SD*).

Abbreviations: BIPQ, brief illness perception questionnaire; DEPS-R, diabetes eating problem survey-revised; IBSS-R, ideal body stereotype scale-revised; PAID, problem areas in diabetes; SATAQ-4R, social attitudes towards appearance questionnaire 4 revised.

9 participants (25.7%) dropped out during the intervention and did not provide posttest data. One participant dropped out prior to the first session, three participants after the first session, one after the second session, and four after the third session. The given reasons for dropping out included family situation ($N = 1$), time ($N = 3$), and difficulty participating in group discussions related to level of disordered eating ($N = 2$). Three participants gave no reasons for dropping out. Home exercises were completed and presented to the group except on 3–4 out of 175 possible occasions; resulting in a completion rate of greater than 97% of the time among the participants completing the Diabetes Body Project.

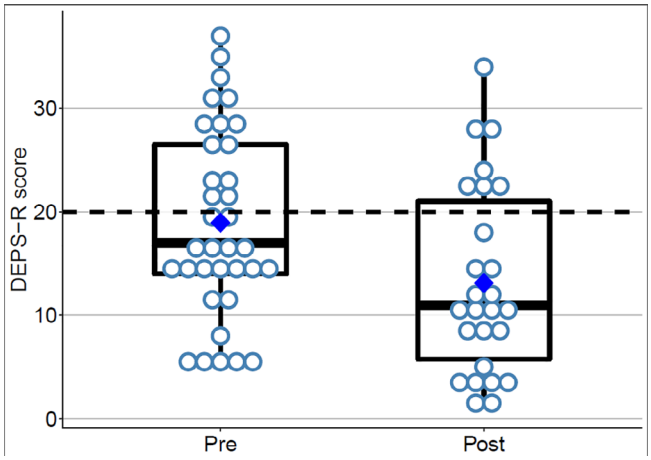

FIGURE 2 Level of eating disorder psychopathology for each participant ($N = 26$) at baseline (pre) and post Diabetes Body Project completion. DEPS-R mean score (*SD*) was 18.9 (8.9) at pretest and 13.2 (8.3) at posttest. Diamonds indicate DEPS-R mean score, and dashed line demonstrates the DEPS-R cut-off for disordered eating (≥20). DEPS-R, diabetes eating problem survey-revised [Color figure can be viewed at wileyonlinelibrary.com]

Spontaneous feedback from participants was mixed in terms of whether the two diabetes-specific sessions should be incorporated before or after the original four sessions. While some participants perceived their diabetes to be so intertwined with their body image that the distinction between them appeared artificial, others expressed that they appreciated this structure. It might improve acceptability of the Diabetes Body Project to acknowledge that all participants have diabetes in session one and to note that diabetes-specific content will be covered later in the intervention.

Due to data protection concerns at Oslo University Hospital, we were required to use Skype for Business, which allowed a total of six individuals to be pictured at one time (the most recent speakers), with the others shown as smaller icons at the bottom of the screen while not speaking. Although not ideal, this was satisfactory, as less talkative participants were actively drawn into the discussions by the group facilitators. At the end of the meeting, participants had been visible approximately an equal amount of time. In the future, virtual platforms that allow all participants to see each other simultaneously would be preferable. Furthermore, debriefing the home exercises took up a considerable portion of the session with 7–8 participants, sometimes leading to other discussions being rushed.

3.3 | Changes over the course of the intervention

Within-group effects from pretest to posttest are presented in Table 3 ($N = 35$). Significant improvements (reductions for all variables except social comparison, in which an increase indicates more favorable comparisons) are evident across most of the included measures, except the clinical impairment and negative affect measure. Medium to large effect sizes are observed in our primary outcomes (i.e., psychopathology, body dissatisfaction, and thin beauty ideal internalization) as well as appearance ideal internalization/perceived

TABLE 3 Results from multiple imputation ($N = 35$) in pre and posttests

Variable	Pre/T1 mean (*SD*)	Post/T2 mean (*SD*)	Mean within group difference T2–T1, 95% CI	*p*-value	Cohen's *d*
Thin ideal internalization	3.34 (0.65)	2.75 (0.83)	−0.60 (−0.86 to −0.33)	<.001	0.81
Body dissatisfaction	3.39 (0.65)	2.92 (0.71)	−0.47 (−0.71 to −0.23)	<.001	0.67
Diabetes ED psychopathology (DEPS-R)	18.9 (8.9)	13.2 (8.3)	−5.77 (−8.1 to −3.5)	<.001	0.83
Eating restraint	2.57 (0.60)	2.05 (0.89)	−0.52 (−0.81 to −0.24)	<.001	0.63
Negative affect	44.7 (13.6)	43.5 (13.0)	−1.23 (−5.8 to 3.4)	.598	0.09
Social comparison (SCS)	57.7 (11.8)	61.3 (11.2)	3.53 (−0.12 to 7.2)	.058	0.32
ED clinical impairment (CIA)	10.0 (7.1)	7.77 (8.8)	−2.24 (−5.0 to 0.56)	.117	0.27
Appearance ideal internalization/perceived pressure (SATAQ-4R)	89.2 (14.2)	79.0 (11.8)	−10.3 (−15.3 to −5.3)	<.001	0.69
Diabetes distress (PAID)	40.9 (17.2)	35.0 (19.5)	−5.93 (−10.2 to −1.7)	.007	0.48
Diabetes illness perceptions (BIPQ)	37.5 (8.9)	34.9 (9.5)	−2.51 (−4.5 to −0.48)	.015	0.41
HbA1c %/mmol/mol (N = 25)	7.44 (1.10)/58	7.15 (1.14)/55	−0.29 (−0.74–0.17)	.214	0.23

Note: Data are means and *SD*. Effect size Cohen's *d*. HbA1c is reported in percentage/mmol/mol, and higher levels indicate poorer glycemic control.
Abbreviation: ED, eating disorders.

pressure (SATAQ-4R). Small to medium effect sizes were found for social comparison, diabetes distress, and diabetes-specific illness perceptions. Complete data analyses ($N = 26$) revealed somewhat larger effect sizes (with Cohen *d*'s up to 1.28) than the multiple imputation for missing data analyses (*d*'s up to .84). See Appendix S1 for results of complete case analyses only.

4 | DISCUSSION

Overall, results indicate that the Diabetes Body Project is applicable and feasible, and is associated with reductions in central ED risk factors and symptoms (e.g., body dissatisfaction, internalization of the thin beauty ideal, and general and diabetes-specific ED psychopathology). The recruitment of 35 participants within 4 months and the moderate drop-out suggest that a virtual group intervention appealed to young females with type 1 diabetes. The online assessment procedure worked well with most of the missing data in the study related to participants who dropped out early and did not complete the posttest.

Meaningful reductions in ED risk factors and symptoms were observed for most variables, reflecting medium to large effect sizes (Cohen's *d* ranging from .41 to .84). These effect sizes are similar to those for the virtual Body Project study by Ghaderi et al. (2020) and for traditional Body Project in-person groups (Stice et al., 2020; Stice, Butryn, Rohde, Shaw, & Marti, 2013), suggesting that the Diabetes Body Project has an impact on young females with type 1 diabetes. Moreover, our effect sizes appear to be somewhat larger than those reported in a previous meta-analysis of traditional Body Project trials (Stice et al., 2019). Specifically, they identified average *d*'s of .57 for thin ideal internalization, .37 for dietary restraint, .42 for body dissatisfaction, and .31 for ED symptoms. As for diabetes-specific ED psychopathology, no previous studies on ED prevention exist to provide a comparison. A systematic review and meta-analysis of interventions for reducing diabetes distress among adults with type 1 and type 2 diabetes found that although statistical significance was observed, most effect sizes were below .2, suggesting that the Diabetes Body Project, with a preliminary effect size of .48, may contribute to improvements in diabetes distress. In a previous study, the Body Project was found to improve cardiac risk among females with ED symptoms (Green et al., 2017a), suggesting that it can produce both medical and psychological improvements. The small nonsignificant changes in HbA1c in the current study are not surprising for several reasons, including a short time interval between assessments, the use of self-reported HbA1c values, and the lack of elevation in mean pretreatment levels. The current study focused on improving body image concerns in young women, and ED risk factors and symptoms were our primary outcomes of interest.

Negative affect and clinical impairment did not show significant changes from pretest to posttest. Negative affect and clinical impairment scores have been significantly reduced in other intervention trials (Ghaderi et al., 2020; Stice et al., 2020; Stice, Marti, Spoor, Presnell, & Shaw, 2008). It has been argued that generic measures of negative affect are not ideal for diabetes populations, given that, for example, anxiety could be considered a natural part of diabetes self-care (e.g., fear of hypoglycemia or late diabetes complications). Therefore, diabetes-specific measures may be more suitable (Snoek, Bremmer, & Hermanns, 2015) for this population. Consistent with this premise, we did observe improvements on The PAID, which is a diabetes-specific measure of emotional distress. The failure to observe improvement on the CIA in the current study may be due to the generic nature of this measure, or may simply reflect the low level of clinical impairment in our sample. The mean baseline score of 10, is considerably lower than the cut-off score of 16, as expected for a nonclinical sample. In comparison, Ghaderi et al. (2020) reported a somewhat higher baseline mean score of 13.2, though not among patients with diabetes.

As noted, small to medium effect sizes were observed in an earlier six-session psychoeducation intervention for adolescent females with type 1 diabetes and disordered eating disorder attitudes and behaviors (Olmsted et al., 2002). The large effect sizes found in the current study are consistent with the premise that interactive, and dissonance-based targeted prevention efforts lead to larger reductions in ED risk factors and symptoms. However, RCT studies are required to determine whether the Diabetes Body Project is more effective than a control condition for young females with type 1 diabetes.

4.1 | Strategies aimed toward increasing uptake of the intervention

Although previous meta-analyses have reported larger effects with larger Body Project groups (i.e., 8–12 participants), our experience that 5–6 participants is ideal for virtual delivery is in line with Ghaderi et al. (2020). Smaller groups may allow group leaders to be more attentive to participants both pictured and currently not pictured (minimized with name and icon only), and facilitate active participation in a virtual setting. This was perceived to be important by group facilitators as nonverbal communication and acknowledgements are limited compared with in-person groups. Future technology may allow a larger number of participants to be pictured at once, but the length of each session needs to be sufficient for all participants to be involved in the discussion. Smaller virtual groups, with five or six participants might have worked better with the technology and time restraints in the current study. Increased participant engagement may reduce drop-out. Our drop-out rate of 26% was slightly lower than the Swedish study (30%; Ghaderi et al., 2020), despite our two additional sessions. Nevertheless, steps should be taken to reduce drop-out in future studies. For example, at study intake, more emphasis could be given to ensuring that participants understand the potential benefits of the group and expectations of participants. Also, previous Body Project studies have used tracking procedures that have resulted in higher retention, for example, collecting information about three people who will always know where the participant is living, updating this contact information every 6-months, and not scheduling groups during the holidays or during school final exam periods.

Using these procedures resulted in only a 9% drop-out rate at posttest in a recent large trial (Stice et al., 2017).

As noted, the virtual format allowed participants to join the groups without considering some of the practical barriers to in-person attendance. Also, participants seemed to appreciate not having to devote more time than an hour for the weekly meetings. This facilitated study recruitment, which can be challenging with select populations. Thus, virtual delivery has the potential to markedly expand the reach of the Body Project and provide opportunities for interaction with similar peers regardless of where they live.

4.2 | Strengths and limitations

This is the first study to explore the utility and effectiveness of the Diabetes Body Project. This is a strength of the current study, given the lack of previous prevention studies and the evidence that females with type 1 diabetes represent a specific risk group for the development of EDs. Another strength of the study is the virtual format, enabling more at-risk individuals to receive a potentially useful targeted prevention intervention. Limitations include the lack of fidelity and therapeutic competence assessments, the small sample size, the lack of follow-up data, the lack of a thorough qualitative analysis on intervention acceptability, the use of self-report measures and the failure to determine ED diagnostic status. We cannot rule out the possibility that some of our participants may have qualified for a ED diagnosis. This is particularly relevant for the participants who dropped out, and for those who had baseline DEPS-R scores above the cut-off for disordered eating behaviors. Finally, the number of performed statistical tests may increase the risk of false positives. However, we have chosen not to adjust for multiple comparisons as correcting for type I errors cannot be done without inflating type II errors (Perneger, 1998).

4.3 | Implications

This pilot study demonstrated promising results with regard to meaningful reductions in ED risk factors and symptoms, suggesting that the virtual Diabetes Body Project may be a useful prevention intervention. Following the Medical Research Council framework (Craig et al., 2013), this indicates that an RCT is warranted to further examine efficacy. Leon, Davis, and Kraemer (2011) underscores that the purpose of a pilot study is to examine feasibility of recruitment, randomization, retention, and assessment procedures over providing effect size estimates for future studies due to the potential inaccuracy in data from small samples. Leon et al., also state that sample size in a future RCT should be based on what effect size would be clinically meaningful rather than pilot data. This should be taken into account when interpreting reported effect sizes in the current study. The Diabetes Body Project is a promising intervention, worthy of more rigorous evaluation. This selective prevention intervention demands relatively few resources, requires little time to train group facilitators, is brief in nature, and can be implemented virtually, which markedly increases reach. This makes broad implementation more feasible. In traditional Body Project research, peer group facilitators have produced slightly larger effects than those achieved by clinician group facilitators, theoretically because peers have greater credibility. This raises the question of whether Diabetes Body Project groups could be led, or at least co-led, by other females with type 1 diabetes. It may be that individuals with type 1 diabetes represent a patient group that requires facilitators be professionals, but this is an empirical question. It would also be valuable to determine whether the Diabetes Body Project significantly reduces future onset of EDs. Finally, an important future direction is to examine whether the Body Project can positively influence HbA1c in the longer term to contribute to a reduction in diabetes-related complications.

5 | CONCLUSIONS

This pilot study suggests that the virtual Diabetes Body Project is a feasible and acceptable ED prevention approach for females with type 1 diabetes and body image concerns. Furthermore, this study provided preliminary evidence that the Diabetes Body Project may improve ED risk factors and symptoms. An RCT is required to determine effectiveness compared with a control condition, and is in development.

ACKNOWLEDGMENTS

This study was funded by the Dam Foundation via the Norwegian Diabetes Association (PI Line Wisting). Marion Olmsted's work is supported by the Loretta Anne Rogers Chair in Eating Disorders at the University of Toronto and University Health Network. The authors would like to thank all the participants for their contributions to the study, and to diabetes clinicians who contributed to spread the word about the Diabetes Body Project. We also thank the user representatives Katrine Mariell Karlsen and Martine Hemstad Lyslid for their valuable contributions to the project, our Body Project working group at Regional Department for Eating Disorders (Kari Anne Katmo Kvistum, Esther Lindeberg, Jeanette Skjønhaug, and Anne-Lise Kvakland in addition to authors), Oslo University Hospital, and the Norwegian Diabetes Association for their contributions to the study and to recruitment.

CONFLICT OF INTEREST

The authors report no conflict of interest.

DATA AVAILABILITY STATEMENT

De-identified data will be shared upon request.

ORCID

Line Wisting https://orcid.org/0000-0002-5424-7290
Trine Wiig Hage https://orcid.org/0000-0003-3712-5950
Eric Stice https://orcid.org/0000-0002-9073-4942
Marion P. Olmsted https://orcid.org/0000-0002-0161-2426
Ata Ghaderi https://orcid.org/0000-0001-8483-7964

REFERENCES

Allan, S., & Gilbert, P. (1995). A social comparison scale: Psychometric properties and relationship to psychopathology. *Personality and Individual Differences*, *19*(3), 293–299. https://doi.org/10.1016/0191-8869(95)00086-L

Bailey, A. P., Parker, A. G., Colautti, L. A., Hart, L. M., Liu, P., & Hetrick, S. E. (2014). Mapping the evidence for the prevention and treatment of eating disorders in young people. *Journal of Eating Disorders*, *2*, 5. https://doi.org/10.1186/2050-2974-2-5

Bersceid, E. J. P. T. (1973). The happy American body: A survey report. *Psychology Today*, *7*, 119–131.

Bohn, K., Doll, H. A., Cooper, Z., O'Connor, M., Palmer, R. L., & Fairburn, C. G. (2008). The measurement of impairment due to eating disorder psychopathology. *Behaviour Research and Therapy*, *46*(10), 1105–1110. https://doi.org/10.1016/j.brat.2008.06.012

Broadbent, E., Petrie, K. J., Main, J., & Weinman, J. (2006). The brief illness perception questionnaire. *Journal of Psychosomatic Research*, *60*(6), 631–637. https://doi.org/10.1016/j.jpsychores.2005.10.020

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. Hillsdale, N.J: L. Erlbaum Associates.

Colton, P. A., Olmsted, M. P., Daneman, D., Farquhar, J. C., Wong, H., Muskat, S., & Rodin, G. M. (2015). Eating disorders in girls and women with type 1 diabetes: A longitudinal study of prevalence, onset, remission, and recurrence. *Diabetes Care*, *38*(7), 1212–1217. https://doi.org/10.2337/dc14-2646

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2013). Developing and evaluating complex interventions: The new medical research council guidance. *International Journal of Nursing Studies*, *50*(5), 587–592. https://doi.org/10.1016/j.ijnurstu.2012.09.010

Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson, & Co.

Ghaderi, A., Stice, E., Andersson, G., Enö Persson, J., & Allzén, E. (2020, Jul). A randomized controlled trial of the effectiveness of virtually delivered body project (vBP) groups to prevent eating disorders. *Journal of Consulting and Clinical Psychology*, *88*(7), 643–656. https://doi.org/10.1037/ccp0000506

Goebel-Fabbri, A. E., Fikkan, J., Franko, D. L., Pearson, K., Anderson, B. J., & Weinger, K. (2008). Insulin restriction and associated morbidity and mortality in women with type 1 diabetes. *Diabetes Care*, *31*(3), 415–419. https://doi.org/10.2337/dc07-2026

Graue, M., Haugstvedt, A., Wentzel-Larsen, T., Iversen, M. M., Karlsen, B., & Rokne, B. (2012). Diabetes-related emotional distress in adults: Reliability and validity of the Norwegian versions of the problem areas in diabetes scale (PAID) and the diabetes distress scale (DDS). *International Journal of Nursing Studies*, *49*(2), 174–182. https://doi.org/10.1016/j.ijnurstu.2011.08.007

Green, M. A., Willis, M., Fernandez-Kong, K., Reyes, S., Linkhart, R., Johnson, M., … Lindberg, J. (2017a). Dissonance-based eating disorder program reduces cardiac risk: A preliminary trial. *Health Psychology*, *36*(4), 346–355. https://doi.org/10.1037/hea0000438

Green, M. A., Willis, M., Fernandez-Kong, K., Reyes, S., Linkhart, R., Johnson, M., … Woodward, H. (2017b). A controlled randomized preliminary trial of a modified dissonance-based eating disorder intervention program. *Journal of Clinical Psychology*, *73*(12), 1612–1628. https://doi.org/10.1002/jclp.22468

Kant, R. M. N., Wong-Chung, A., Evans, E. H., Stanton, E. C., & Boothroyd, L. G. (2019). The impact of a dissonance-based eating disorders intervention on implicit attitudes to thinness in women of diverse sexual orientations. *Frontiers in Psychology*, *10*, 2611. https://doi.org/10.3389/fpsyg.2019.02611

Le, L. K., Barendregt, J. J., Hay, P., & Mihalopoulos, C. (2017). Prevention of eating disorders: A systematic review and meta-analysis. *Clinical Psychology Review*, *53*, 46–58. https://doi.org/10.1016/j.cpr.2017.02.001

Leon, A. C., Davis, L. L., & Kraemer, H. C. (2011). The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Research*, *45*(5), 626–629. https://doi.org/10.1016/j.jpsychires.2010.10.008

Markowitz, J. T., Butler, D. A., Volkening, L. K., Antisdel, J. E., Anderson, B. J., & Laffel, L. M. (2010). Brief screening tool for disordered eating in diabetes: Internal consistency and external validity in a contemporary sample of pediatric patients with type 1 diabetes. *Diabetes Care*, *33*(3), 495–500.

Nielsen, S., Emborg, C., & Mølbak, A. G. (2002). Mortality in concurrent type 1 diabetes and anorexia nervosa. *Diabetes Care*, *25*(2), 309–312. https://doi.org/10.2337/diacare.25.2.309

Olmsted, M. P., Colton, P. A., Daneman, D., Rydall, A. C., & Rodin, G. M. (2008). Prediction of the onset of disturbed eating behavior in adolescent girls with type 1 diabetes. *Diabetes Care*, *31*(10), 1978-1982.

Olmsted, M. P., Daneman, D., Rydall, A. C., Lawson, M. L., & Rodin, G. (2002). The effects of psychoeducation on disturbed eating attitudes and behavior in young women with type 1 diabetes mellitus. *International Journal of Eating Disorders*, *32*(2), 230–239. https://doi.org/10.1002/eat.10068

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *BMJ*, *316*(7139), 1236–1238.

Polonsky, W. H., Anderson, B. J., Lohrer, P. A., Welch, G., Jacobson, A. M., Aponte, J. E., & Schwartz, C. E. (1995). Assessment of diabetes-related distress. *Diabetes Care*, *18*(6), 754–760.

Reas, D. L., Ro, O., Kapstad, H., & Lask, B. (2009). Psychometric properties of the clinical impairment assessment: Norms for young adult women. *International Journal of Eating Disorders*, *43*(1), 72–76. https://doi.org/10.1002/eat.20653

Rodin, G. M., & Daneman, D. (1992). Eating disorders and IDDM. A problematic association. *Diabetes Care*, *15*(10), 1402–1412. https://doi.org/10.2337/diacare.15.10.1402

Saßmann, H., Dehn-Hindenberg, A., Jördening, M., Huhn, F., Landgraf, R., & Lange, K. (2020). Young people with type 1 diabetes: Prevalence of disturbed eating behaviour and psychosocial care. *Psychotherapie Psychosomatik Medizinische Psychologie*, *70*(11), 449–456. https://doi.org/10.1055/a-1142-6705

Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders*, *50*(2), 104–117. https://doi.org/10.1002/eat.22590

Snoek, F. J., Bremmer, M. A., & Hermanns, N. (2015). Constructs of depression and distress in diabetes: Time for an appraisal. *The Lancet Diabetes and Endocrinology*, *3*(6), 450–460. https://doi.org/10.1016/s2213-8587(15)00135-7

Stice, E., Butryn, M. L., Rohde, P., Shaw, H., & Marti, C. N. (2013). An effectiveness trial of a new enhanced dissonance eating disorder prevention program among female college students. *Behaviour Research and Therapy*, *51*(12), 862–871. https://doi.org/10.1016/j.brat.2013.10.003

Stice, E., Marti, C. N., Shaw, H., & Rohde, P. (2019). Meta-analytic review of dissonance-based eating disorder prevention programs: Intervention, participant, and facilitator features that predict larger effects. *Clinical Psychology Review*, *70*, 91–107. https://doi.org/10.1016/j.cpr.2019.04.004

Stice, E., Marti, C. N., Spoor, S., Presnell, K., & Shaw, H. (2008). Dissonance and healthy weight eating disorder prevention programs: Long-term effects from a randomized efficacy trial. *Journal of Consulting and Clinical Psychology*, *76*(2), 329–340. https://doi.org/10.1037/0022-006x.76.2.329

Stice, E., Marti, N., Shaw, H., & O'Neil, K. (2008). General and program-specific moderators of two eating disorder prevention programs. *The International Journal of Eating Disorders*, *41*(7), 611–617. https://doi.org/10.1002/eat.20524

Stice, E., Presnell, K., Gau, J., & Shaw, H. (2007). Testing mediators of intervention effects in randomized controlled trials: An evaluation of two eating disorder prevention programs. *Journal of Consulting and Clinical Psychology*, *75*(1), 20–32. https://doi.org/10.1037/0022-006x.75.1.20

Stice, E., Rohde, P., Durant, S., & Shaw, H. (2012). A preliminary trial of a prototype internet dissonance-based eating disorder prevention program for young women with body image concerns. *Journal of Consulting and Clinical Psychology*, *80*(5), 907–916. https://doi.org/10.1037/a0028016

Stice, E., Rohde, P., Shaw, H., & Gau, J. M. (2017). Clinician-led, peer-led, and internet-delivered dissonance-based eating disorder prevention programs: Acute effectiveness of these delivery modalities. *Journal of Consulting and Clinical Psychology*, *85*(9), 883–895. https://doi.org/10.1037/ccp0000211

Stice, E., Rohde, P., Shaw, H., & Gau, J. M. (2020). Clinician-led, peer-led, and internet-delivered dissonance-based eating disorder prevention programs: Effectiveness of these delivery modalities through 4-year follow-up. *Journal of Consulting and Clinical Psychology*, *88*(5), 481–494. https://doi.org/10.1037/ccp0000493

Stice, E., Shaw, H., & Marti, C. N. (2007). A meta-analytic review of eating disorder prevention programs: Encouraging findings. *Annual Review of Clinical Psychology*, *3*, 207–231. https://doi.org/10.1146/annurev.clinpsy.3.022806.091447

Stice, E., Yokum, S., & Waters, A. (2015). Dissonance-based eating disorder prevention program reduces reward region response to thin models; how actions shape valuation. *PLoS One*, *10*(12), e0144530. https://doi.org/10.1371/journal.pone.0144530

Strandberg, R. B., Graue, M., Wentzel-Larsen, T., Peyrot, M., & Rokne, B. (2014). Relationships of diabetes-specific emotional distress, depression, anxiety, and overall well-being with HbA1c in adult persons with type 1 diabetes. *Journal of Psychosomatic Research*, *77*(3), 174–179. https://doi.org/10.1016/j.jpsychores.2014.06.015

Tobin, L. N. (2020). Dissonance-based eating disorder preventive intervention and attentional biases in body-dissatisfied university women: A cluster randomized controlled trial arts (Unpublished Doctoral Thesis). University of Calgary, Calgary, AB.

Van Strien, T., Frijters, J. E., Van Staveren, W. A., Defares, P. B., & Deurenberg, P. (1986). The predictive validity of the Dutch restrained eating scale. *International Journal of Eating Disorders*, *5*(4), 747–755.

Watson, D., & Clark, L. A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology*, *62*(3), 489.

Wisting, L., Frøisland, D. H., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2013). Psychometric properties, norms, and factor structure of the diabetes eating problem survey-revised in a large sample of children and adolescents with type 1 diabetes. *Diabetes Care*, *36*(8), 2198–2202. https://doi.org/10.2337/dc12-2282

Wisting, L., Rø, A., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2019). Disturbed eating, illness perceptions, and coping among adults with type 1 diabetes on intensified insulin treatment, and their associations with metabolic control. *Journal of Health Psychology*, *26*(5), 688–700. https://doi.org/10.1177/1359105319840688

Wisting, L., Siegwarth, C., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2020). The impact of psychological aspects, age, and BMI on eating disorder psychopathology among adult males and females with type 1 diabetes. *Health Psychology Open*, *7*(2), 2055102920975969. https://doi.org/10.1177/2055102920975969

Wisting, L., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2018). Prevalence of disturbed eating behavior and associated symptoms of anxiety and depression among adult males and females with type 1 diabetes. *Journal of Eating Disorders*, *6*, 28. https://doi.org/10.1186/s40337-018-0209-z

Wisting, L., Wonderlich, J., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2019). Psychometric properties and factor structure of the diabetes eating problem survey: Revised (DEPS-R) among adult males and females with type 1 diabetes [journal article]. *Journal of Eating Disorders*, *7*(1), 2. https://doi.org/10.1186/s40337-018-0232-0

Young, V., Eiser, C., Johnson, B., Brierley, S., Epton, T., Elliott, J., & Heller, S. (2012). Eating problems in adolescents with type 1 diabetes: A systematic review with meta-analysis. *Diabetic Medicine*, *30*(2), 189–198. https://doi.org/10.1111/j.1464-5491.2012.03771.x

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Wisting, L., Haugvik, S., Wennersberg, A. L., Hage, T. W., Stice, E., Olmsted, M. P., Ghaderi, A., Brunborg, C., Skrivarhaug, T., Dahl-Jørgensen, K., & Rø, Ø. (2021). Feasibility of a virtually delivered eating disorder prevention program for young females with type 1 diabetes. *International Journal of Eating Disorders*, 1–11. https://doi.org/10.1002/eat.23578